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AUTHOR Orvik, James M.
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ABSTRACT

In Fall 1971, the U.S. Bureau of Indian Affairs' (BIA) Bethel Agency implemented an experimental Yupik bilingual program into the primary grades of 3 lower Kuskokwim village day schools. Simultaneously the Alaska State-Operated School System (ASOSS) introduced Yupik bilingual programming in a kindergarten classroom at Bethel Elementary School. Both agencies shared certain program components (mainly in the areas of staff and materials development), and many of the concepts generated by the BIA were subsequently incorporated by the ASOSS bilingual program. This report presents the evaluation and research findings of the first 3 years of both the BIA and ASOSS programs. In some cases, data are given for only one of the agency programs; however, where program similarity justifies, data are generalized to estimate conditions and outcomes for both agencies. Data range from formal language test data to impressionistic data where staff and community members were informally interviewed. An overview of bilingual education is given, defining its spectrum and listing the BIA and ASOSS programs and where on the spectrum they exist. The main program components (instruction, staff development, materials development, and community involvement) are analyzed by addressing prominent operational and theoretical questions which arose during the programs' first 3 years. (Author/NQ)

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Four Years of Bilingual Education: The Yupik Language Program in Southwestern Alaska

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James M. Orvik

Center for Northern Educational Research
University of Alaska
Fairbanks, Alaska 99701

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Four Years of Bilingual Education: The Yupik Language Program in Southwestern Alaska

James M. Orvik
Center for Northern Educational Research

CHAPTER I

Introduction

Bilingual education is established as a permanent force in rural Alaska. In the fall of 1971, the Bethel Agency of the U.S. Bureau of Indian Affairs put an experimental Yupik bilingual program into operation in the primary grades of three lower Kuskokwim village day schools. Simultaneously the Alaska State-Operated School System introduced Yupik bilingual programming in a kindergarten classroom in the Bethel Elementary School. These dates marked the operational beginning of a movement which had already seen a year of formal preparation preceded by extensive linguistic ground work which established the necessary orthography leading to literacy training and the development of materials to support the new curriculum.

Both agencies shared certain program components, mainly in the areas of staff development and materials development, and many of the concepts generated by the Bureau of Indian Affairs (BIA) were subsequently incorporated by the Alaska State-Operated School System (ASOSS) bilingual program. However, two different sources of funds supported the programs, ASOSS funds coming from Title VII of ESEA, and BIA funds from the Bureau's Title I allocation.

The following is an account of the first three years of pioneering development and implementation of Alaska's first and to date most comprehensive bilingual education program. This report is an attempt to draw together the evaluation and research findings of the author while he was program evaluator for both the BIA and ASOSS bilingual programs and, for the current year, as recipient of a research grant from the National Institute of Education (NIE), to study relationship between bilingual education and cultural identity. In some cases, data exists only for one of the agency programs but, where program similarity justifies, the data is generalized to estimate conditions and outcomes for both agencys' efforts. Where results and impressions are not generalizable to both programs, the author so states. The data upon which the report is based range from formal language test data, to impressionistic data where the author informally interviewed staff and community to arrive at conclusions. The author hopes to make clear either by direct statement or by context, the basis upon which his conclusions rest, whether on relatively sound scientific data, or on the analysis of his own observations and impressions.

Organization of the Report

The report is organized into five chapters. The remainder of the present chapter gives an overview of bilingual education, defining its spectrum and listing the programs the report covers, and where on the spectrum they exist. Chapter two presents the formal research methods used during the evaluation period. Findings for the three years the author evaluated the BIA and ASOSS

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Yupik bilingual program are presented in chapter three. Chapter four analyzes the main program components; instruction, staff development, materials development, and community involvement, by addressing prominent operational and theoretical questions which arose during the first three program years. These questions are drawn together as a group of major themes surrounding the total bilingual effort in Alaska. Finally, chapter five attempts to offer some perspective for evaluating bilingual education as a major sociological force, focusing on its potential for influencing the future survival of indigenous cultures within the dynamics of a changing Alaska.

Definitions of Bilingual Schooling

In the Draft Guidelines to the Bilingual Education Program for preparing program proposals under Title VII - Elementary and Secondary Education Act (1967 amendment), the following definition appears:

> Bilingual education is instruction in two languages and the use of those two languages as mediums of instruction for any part or all of the school curriculum. Study of the history and culture associated with a student's mother tongue is considered an integral part of bilingual education. (1967, p. 1)

Similarly, Gaarder (1967) defined the bilingual school as one "which uses, concurrently, two languages as mediums of instruction in any portion of the curriculum." He goes on to say, "teaching of a vernacular solely as a bridge to another, the official language, is not bilingual education . . ., nor is ordinary foreign language teaching."

Both of the definitions make clear the importance of the language as a medium of instruction not just as subject matter, in order to qualify as bilingual schooling. Stressing the point, Anderson and Boyer (1969) take care to note that English as a Second Language (ESL) programs, and cultural awareness programs are often mislabeled bilingual education. They make a needed point that "such indiscriminate use of the term renders it meaningless."

There are distinctions worth maintaining among types of bilingual programs, all of which may qualify under the above definition. Mackey (1969), addressed this problem by conceptualizing a typology of bilingual education which accounts for ten basic curriculum patterns for five types of learners. Beginning with the latter, Mackey sees the home and school language congruence as a key to typing bilingual education situations. The five types are:

1. Unilingual home: where the home language is school language.
2. Unilingual home: where the home language is not school language.
3. Bilingual home: both home languages include one school language.
4. Bilingual home: both home languages exclude school languages.
5. Bilingual home: both home languages include both school languages.

The ten curriculum patterns Mackey identifies vary according to five factors:

1. The medium of instruction may be one language, two languages, or more; in other words, the school may have a single medium or a dual medium curriculum;
2. The development pattern may be to maintain two or more languages, or to transfer from one medium of instruction to another;

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3. The distribution of the languages may be to present different or equal amounts during the day;

4. The direction may be toward assimilation into a dominant culture, toward acculturation, or toward reintegration into a resurgent one, or it may be neither, but simply the maintenance of the languages at an equal level;

5. Finally, the change from one medium to another may be complete or gradual.

It should be pointed out that Mackey's typology is not consistent with the earlier definition in that two languages need not be present as mediums of instruction in order to be classified. The only requirement is for a bilingual context to exist either in the school, or in the interaction between the school and the learner's home, his community, or his country. By so doing, Mackey created a comprehensive scheme capable of describing any and all cases of bilingual schooling.

The bilingual schools in Alaska upon which the present report is based do not literally fit the earlier definitions strictly requiring two languages as mediums of instruction. The first three years of the Alaska programs include ESL as subject matter while the medium of instruction is carried in the first language (Yupik). Despite the fact that the intentions of the program were to raise second language proficiency to the point where English could be used as a medium of instruction in the postprimary years, it would be absurd to disqualify the program as bilingual on a simple technicality. In fact, the advantage of Mackey's

typology is to provide enough flexibility to encourage a variety of local forms of bilingual education without losing any definitional precision.

Even with the apparent definitional precision offered by this typology, the process of assigning schools included in this report to their correct location is by no means uncomplicated, but they are probably best classified in the following way:

1. Medium -- dual, even though English is taught, necessarily, as a second language, both are eventually to serve as instruction mediums.
2. Development -- Maintenance, although some disagreement may exist among program officials, or between agencies, the sentiment among program consumers is that both languages are important and must be developed and used.
3. Direction -- Biculturalism, as opposed to institutional acculturation, although even here controversy arises as to the long range "oughts" regarding the future of Alaska's ethnic minorities. Again, the author's impression is that acculturation is not a popular direction among most consumers.
4. Distribution -- Different over different areas of subject matter, especially in early primary.
5. Change -- Gradual, English is increased systematically and gradually over the years, with some minor exceptions.

Schools providing comparison data in the present report have a single medium curriculum in a context of unilingual homes, where the home language is not the school language. There is a tendency toward acculturation, though not exclusively so, and because there is only one language as a medium of instruction, the questions of distribution and change, in Mackey's typology, are irrelevant.

Unfortunately, while the above definitions and typologies account for all or more of the important forms an educational program can take, none consider the social or political aspects of the situations in which the programs exist. Describing the educational intentions of program planners gives only a portion of the picture, leaving the reader unable to evaluate the appropriateness of the educational plan for its social context.

Recent works by Spolsky (1974), and Erickson (1974) draw attention to the social context of bilingual education by adding non-school factors to existing descriptive models. Erickson stresses the "political" factors entering the descriptive system, suggesting the "politics of speaking" in a community are important to evaluating the appropriateness of a particular educational approach. To translate an example given in Erickson's account into the present discussion of descriptive systems, a program may be intended to have the effect of language maintenance, but without accounting for the social context establishing the program, it could literally succeed by failing or fail by succeeding. As stated by Erickson:

> By analyzing the actual "politics of speaking" in a program, researchers could determine how much the formal curriculum and social organization of the program was fostering first language maintenance. In addition, and perhaps even more importantly, this approach to evaluation could determine whether or not the informal or "hidden" curriculum and social organization of the program was inadvertently discouraging students from using their first language, despite the best intentions of the staff, parents, and the students themselves.

Spolsky sought to develop a formal model to account for the total context of bilingual programming. The model is based on a hexagon, each side of which represents a set of important factors influencing the educational program. The factors Spolsky considers important are labeled psychological, sociological, economic, political, religio-cultural, and linguistic. While each set has special significance for influencing the nature of an educational program, not all factors are equally important for all programs, and may even assume differential importance at different phases in the life of a single program.

The details of the descriptive systems offered by Spolsky and Erickson are too involved for the short introduction given here, and the interested reader is advised to pursue the source documents for further elaboration. Also, the above mentioned systems did not serve as a basis for developing evaluation plans discussed in the later chapters of this report, even though some of the factors are treated by implication. The main reason for their being discussed is to give the reader some idea as to the complexity of the situations in which bilingual programs find themselves.

While most innovative education programs involve more than how to improve student performance, intercultural program, because they are often

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designed to reverse drastically a host of political, religious, economic, and social trends, require a more comprehensive view in order for their long range implications to be fully understood.

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CHAPTER II

Research Methods

Bilingual program evaluation took two general approaches during the author's three years as program evaluator. These two approaches are best termed internal and external evaluation, and suggest processes designed to look at the program from within the framework of program management in the former case, and from outside the program, taking the viewpoint of an objective researcher in the latter case. The methods of internal program evaluation speak to the need to gather rapid, day-to-day information about the program in its formative and early operational stages and is well suited to the formation of ongoing impressions about the main program components. Such a picture is necessary for program management to make timely program adjustments during the course of the school year. The most important impressions gained from this approach to evaluation will be outlined in chapter four.

The present chapter describes the research methods of the external evaluation component. The first purpose of external evaluation of the bilingual program was to monitor the extent to which general changes took place in the total language development of the child, beyond those specifically targeted in the instructional objective of the program. The second purpose of external evaluation was to provide data by which an objective comparison could be made between bilingual and traditional approaches. Only by measuring general skills external but relevant to the specific curricula of either the bilingual or the traditional approach could a comparative assessment be made of the relative impact of each.

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General Method

Since the goal of external evaluation was to assess by objective means the impact of the new program on language growth, evaluation in the first three program years sought to determine the extent to which general language changes took place in the bilingually taught children. To assess the magnitude of such changes it was necessary to compare them with changes that might be expected to have happened under the traditional, unilingual approach. The best direct estimate of such changes under traditional programming was obtained by selecting village schools in the same general location as the bilingual program schools but in which the traditional unilingual program was in operation. While the use of nearby villages for a comparison standard is not an unquestionably perfect standard of what would have taken place in the bilingual schools under a traditional program, it is a best and by no means invalid estimate. The sources contributing to variation in environment from village to village are difficult to account for but there is no reason to believe at this time that fundamental differences exist in the social, cultural, economic, or linguistic atmospheres of the target area villages to disqualify any as an exemplar of Southwestern Yupik Eskimo life as it influences school age children. Nor is common educational research practice violated, since the comparison classroom method is often used for showing the relative effect of some kind of education innovation.

During the first three years of program evaluation, the design for gathering data changed to increase the number of schools tested and the range of tests given. Since the procedures varied from year to year, the methods for each

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year will be summarized separately, as will their results. Since much of the evaluation process took place under unknown conditions, there were a number of initial design errors and missed opportunities. Attempts will be made to present these mistaken procedures whenever possible, in hopes that others might profit from the full range of the author's experience, the successful parts as well as the unsuccessful.

First Year Evaluation Design

The rationale for the initial year of evaluation was to obtain a profile of each entering child in comparison and bilingual schools, based on five variables considered relevant to the goals of the program. These five variables are indicated by the tests used to measure them:

1. the Raven Coloured Progessive Matrices (RCPM)
2. the Yupik Receptive Vocabulary Test (YRV)
3. the English Receptive Vocabulary Test (ERV)
4. the Yupik Expressive Vocabulary Test (YEV), and
5. the English Expressive Vocabulary Test (EEV)

The RCPM is described by its author as "a test of observation and clear thinking." The main reasons for including the RCPM in the test battery was to provide: (a) a stable basis for matching and comparing pupils in the bilingual and traditional schools and (b) a measure for making potential statistical adjustments to the extent pupils in the two kinds of program were found to differ in that regard.

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At the risk of anticipating the next chapter a word on the subsequent usefulness of the RCPM is warranted before proceeding. In a study related to the present evaluation design (Orvik, 1971), certain features of the RCPM came into question regarding its validity for cross-cultural situations. Information later came to light in the form of anecdotal observation that the standard instructions (translated into Yupik) in the RCPM manual tended to have an interaction with certain cultural factors depressing the scores of Eskimo children inordinately. The standard instructions require the tester to question the child's answers to "be sure that's the right one." Eskimo children tended to take this as a cue that their answer was wrong and often would change correct responses to incorrect ones. Thus, the RCPM, while interesting up to a point, was dropped early in the evaluation design.

The four vocabulary tests listed above were developed specifically for the Yupik bilingual project to establish appropriate base lines of linguistic competences of experimental and comparison pupils in the two proposed languages of instruction (Yupik and English). By further differentiating competences into receptive and expressive skills, it was hoped that (a) greater score variance might be obtained, and (b) qualitative profiles could be drawn, affording a richer system for describing pupils entering the program, based on four items of linguistic information rather than two.

The general approach taken to test receptive skills utilized a picture vocabulary in which the child simply pointed to one of four pictures which meant a stimulus word uttered by the tester. Conversely, expressive vocabulary was

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measured by having the child identify, describe or explain the content portrayed in a picture pointed to by the tester.

Again, risking anticipation of the next chapter, the fate of the expressive vocabulary tests should be explained before proceeding. After reviewing the data based on the expressive vocabulary procedure, it became quite clear that a reliable and valid method for scoring them would be difficult, if not impossible. The main problem was the different testers appeared to have recorded the childrens' responses in different ways. Some scores were just recorded as "right" or "wrong" while others were taken down apparently verbatium. In order to develop an objective scoring system, however, all the responses had to have been available. The effort was chalked up to experience and the need for more pilot testing of procedures for eliciting language samples was appropriately noted. This problem of course did not apply to the receptive vocabulary test procedures since the recording of responses were uniform for all children and did not require transcribing lengthy verbal utterances.

Beyond these general considerations each of the four tests has its own development history. The Yupik Receptive Vocabulary Test encountered the most complex developmental process of the four, as outlined in the following steps.

First, an illustrator native to the Yupik dialect area was employed to generate pen and ink pictures illustrating vistas, activities, objects and concepts indigenous to the local culture and environment. A starting pool of approximately 250 pictures was so generated.

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Next, these pictures were submitted to Yupik teachers, in training for the bilingual program, who supplied Yupik word concepts commonly associated with the content of each picture. The word list was then pared down by casting out repetitions, unorthodox spellings, and peripheral associations. An additional set of ratings was then obtained in which an initial estimate of the difficulty level of each word was established. These difficulty ratings were used in a later step to help insure an appropriately broad difficulty range for the final form of the test.

In the next step, the pictures were grouped into sets of four according to commonality of content. For example, a plate might consist of four pictures depicting children's play, or four kinds of food preparing activities. Fifty-one plates were prepared in this manner.

Finally, two stimulus words were chosen for each plate by selecting one word from the "easy" end of the difficulty scale and one from the difficult end.

The picture associated with each stimulus word was assigned to its position on its plate at random so systematic answering strategies on the part of the respondent would be discouraged.

The tests for measuring Yupik receptive vocabulary resulting from these procedures consisted of 95 items.[1] To administer the items, the tester exposed each plate to the child and asked in Yupik, "show me the one that

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[1] The number of test items was later reduced to 80 for easier administration and scoring.

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means _____", or some appropriate variant.[1] The tester then recorded the child's response on an answer sheet by marking the number of the picture to which the child pointed.

The English Receptive Vocabulary Test involved fewer steps in its development than the Yupik. The picture grouping procedure was much the same requiring the child generally to make rather fine distinctions within concept categories in order to achieve a correct response. The stimulus words were chosen by the evaluator who estimated difficulty levels, selecting "easy" and "difficult" words for each of 40 plates for a total of 80 items for the initial version of the English Receptive Vocabulary Test. The administration of this test was also in Yupik except, of course, for the English stimulus word.

To measure expressive vocabulary, in both Yupik and English, the child was asked to respond sequentially to the twelve pictures comprising the first three plates of the Yupik Receptive Vocabulary Test. These particular pictures were chosen for the sake of administrative convenience. The procedure was as follows. The tester pointed to the first picture and said (in Yupik), "this is a sack and you can use it to carry things", then pointing to the second picture, said, "this is an oar; what can you do with that?" After the second picture, the tester just asked the child what the object was and what he could do with it, and was to record the response verbatim. For English Expressive Vocabulary the child was requested to respond in English if he could. Since neither of the

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[1] All testing was conducted in Yupik by native testers trained by the project evaluator.

expressive vocabulary procedures were used in the final evaluation, their further mention will not be necessary.

Before going further it is appropriate to report the reliability of the tests used in the first year of evaluation. Since reliability refers to stability or consistency of a test, one way to estimate these attributes is to intercorrelate the scores obtained from two different subsets of items, chosen by a random procedure. In the present case, scores on odd numbered plates were correlated with scores on the even numbered plates. The resulting correlations were then corrected[1] to the value that would have been obtained for a test of the original length (rather than half the length). With these methods the reliabilities of the Yupik Receptive Vocabulary and the English Receptive Vocabulary tests were r_{tt} = .59 and .58, respectively. The RCPM was lower in reliability by this particular method, r = .41, but the appropriateness of the method may be questioned on the grounds that the test is short to begin with (36 items), and two comparable sets of items are very difficult to draw, even at random. The reliability coefficient reported here is most likely an underestimate of the "true" reliability of the RCPM.

In the second year of program evaluation information was gathered as to the validities of the tests, using observations of first and second language teachers in the program. During the bilingual program's in-service workshop, in February, 1972, the participating teachers were asked to rank-order their

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[1] The Spearman-Brown Prophecy Formula was used in which $r_{tt} = 2\, r_{hh}/(1 + r_{hh})$, where r_{hh} is the correlation between the two halves of the total test.

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pupils as to their ability to use Yupik or English (depending on whether the rater was a first or second language teacher). Since there was only one second language teacher per school, no estimate of interjudge agreement was possible on the English vocabulary test. However, in those villages where there were two or more first language teachers estimates of interjudge agreement were made by the method of rank correlation. Additionally, four teachers (two first and two second language) made two sets of ratings approximately three months apart, so some idea of intrarater consistency could be obtained.

Regarding interrater consistency for the Yupik test, five sets of ranks were correlated representing three villages. The correlations ranged from ρ = .65 to ρ = .80, with an average $\bar{\rho}$ = .72. The four estimates of intrarater agreement ranged from ρ = .50 to ρ = .97, with an average $\bar{\rho}$ = .80.

It would seem then that the teacher ratings possess sufficient consistency not to be disqualified as a test validation criterion on that account. Whether the teacher ratings are also valid by any other criterion is a different question. One consideration is that if the vocabulary tests are valid markers of some educationally relevant property they must necessarily relate to something observable by the teachers. If the teacher cannot be shown to identify reliably some correlation of the marker variable, its ability for evaluation purposes should be questioned.

To assess the validity of the Yupik and English vocabulary tests, pupils' pretest scores were correlated with the ranks given by their teachers. For the Yupik test the value for the six obtained coefficients ranged from r = .14

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to r = .69 with an average $\bar{r}$ = .45. There were enough cases where substantial validity (four of the six were of magnitude r = .40 or greater) was shown to suggest adequate validity for the Yupik test. For the English test the five obtained correlations ranged from r = .24 to r = .80 ($\bar{r}$ = .64), with four of the five of magnitude r = .50, or greater. Again, this indicates sufficient test validity for use as an evaluation marker considering two very different methods were used to measure a single trait.

General Procedures

The testers were chosen, largely by their availability for travel, from a group of eight Yupik-English bilingual trainees of the University of Alaska in the summer of 1970. Approximately two weeks of one-hour-per-day sessions were devoted to tester training at the University during the summer. A warm-up session lasting two days was held in Bethel just prior to gathering base line data. This session afforded the testers field experience and allowed previously unforeseen difficulties a chance to be resolved.[1]

Base line pretesting took place during the first month of the school year 1970-71 in all villages then involved in the program; either as Experimental or Comparison classrooms.

The posttesting took place in the last month of the school year. Some unforeseen circumstances attended this aspect of global evaluation which will

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[1] Mr. Walter Featherly, Director of the Bureau of Indian Affairs Bilingual Program, provided logistical support of the testing activities from his base in Akiachak.

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give the reader some feel for difficulties inherent evaluating education programs in remote areas of Alaska. Overshadowing nearly all plans and activities in Alaska is yearly "breakup" of ice-packed rivers and frozen, snow-laded ground. During this time river-ice and mud-laced airstrips become extremely hazardous for airplane landings. Some villages can become totally isolated for days, even weeks, under these conditions. Southwestern Alaska was particularly unpredictable in the period coinciding with posttesting activities in May 1971. It was decided to take emergency steps to maximize the amount of valid data gathered, by having each tester travel separately rather than in a team, as was done in the pretest phase. The villages were then covered as quickly as possible in the order of their susceptibility to isolation caused by breakup. The extent to which this harried schedule may have placed a strain on the rapport between tester and pupil is difficult to assess, but the possibility is not unlikely.

Another unanticipated event led to the loss of the RCPM posttest data. The test booklet for one of the team members was misplaced during the year but the loss was not discovered until the press of the schedule was already in motion. It was decided the posttest RCPM data was not important enough to warrant the delay needed to replace the booklet.

Methods of Data Analysis

The analysis of pre and posttest data was broken into two general categories: 1) the analysis of the initial comparability of the experimental (bilingual) and comparison (traditional) classrooms in Bethel and participant

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villages surrounding Bethel, and 2) the analysis of relative gains in vocabulary acquisition shown by children in experimental and comparison classrooms.

Initial comparability. The analysis of the initial comparability of the experimental and comparison groups consisted mainly of testing the statistical significance of the difference between group means on the various tests in the battery. This procedure (the t-test for independent means) provides a basis in probability for deciding whether two groups possess equivalent levels of some attribute prior to the initiation of a program. Because a priori differences in the target children existed between Bethel and surrounding villages (e.g. age, enculturation, school-grade) they were analyzed separately.

Relative gains. Procedures similar to the above were used to analyze the relative gains made by each group. One difference, however, was wherever a posttest score for a child was obtained the gain could be referenced to his pretest score affording a more accurate basis for estimating the probability that various sized gains might be attributable to chance factors as opposed to real growth. This procedure is called t-test for non-independent, or correlated means. This kind of analysis is supplemented by the first-mentioned procedure, where comparability on vocabulary measures was assessed on posttesting as well as pretesting to look at relative growth from a slightly different direction.

One should bear in mind that the most meaningful index for determining the magnitude of a difference is not the absolute difference between the means, or the size of the t-value used to test the difference, but the probability value

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(p) associated with the t-value. This probability value takes into consideration the size of the differences as well as the number of scores on which it is based. This is important since the number varies from group to group and a small difference based on a large group may be more indicative of growth than a larger difference based on a small group, the latter being more subject to the relative instability associated with small samples. The probability value helps adjust for these problems and therefore affords a better judgmental basis.

Second Year Evaluation Design

For a number of reasons the evaluator considers the second year of the program an "interim" evaluation phase, which is only another way of saying in retrospect the design left much to be desired. Modifications were made in the design at the requests of both bilingual program funding agencies, mostly in the interests of saving classroom testing time and project money. The evaluator complied with the requested modifications not foreseeing all of the pitfalls to which they later led.

The basic design was a replication of the first year design but modified in the following ways. First, the testing was done by bilingual teachers in their own villages to save the time and expense of a more highly selected testing team having to travel from village to village. The second modification was to drop the comparison villages from the design and instead test children in the two grades of the bilingual program schools just ahead of the grade level in which the program was being implemented. Such a comparison group would then

provide base line data for the following two years of evaluation and presumably save money and time in the short run.

Reasonable as these modifications may seem, there were obvious problems which at the time did not seem out of proportion to the time and funds saved through their implementation. The first modification introduced an unknown but probably not inconsiderable amount of bias in favor of the program by a confounding between whether or not the child was in the bilingual program, and whether or not he knew the tester intimately in a pupil-teacher relationship. The second pitfall of the design modification was that bringing more testers into the operation interjected more intertester variability into the test results. A related problem was the reduction in quality control on tester performance because there were more of them to train and monitor.

The third pitfall is perhaps less serious but warrants mention because of its future design implications. By employing children as comparison subjects who are ahead of the implemeniation grade level within a given village, control is obtained for intervillage environmental variance and from that standpoint improve the "best estimate" of traditional program impact. But at the same time another source of unwanted variation in unknown amounts is introduced in the form of bilingual program influence diffusing into the upper grades. The problem comes from the diffusion process being introduced between the pre and posttest periods, and in an unknown amount. While the amount of diffusion is not known precisely, anecdotal evidence suggests it is a considerable force in some homes, where younger children in the program were "educating" their

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older brothers and sisters in such things as how to count in Yupik, sing songs, write, and so on. From a program standpoint such a process is more than what usually would be hoped for in an innovative program, but for evaluation it is a nuisance which casts whole blocks of data under suspicion.

With these cautions in mind, the evaluator has become increasingly conservative about the conclusions to be drawn from the second year of program operations. However, some of the findings gave hint of trends which could be important for the total direction of bilingual programming. Rather than enumerate statistics these trends will be summarized in chapter three in general narrative form so the presentation might be advanced more rapidly to the third year procedures and findings.

Third Year Evaluation Design

The evaluation design for the third year (1972-73) evolved from substantive as well as logistical findings of the first two years and embraces a number of major modifications. First, the number of performance skills measured was expanded to reflect the need for specific information sought by program officials. Second, sources of objectivity compromised in the second year evaluations were restored by returning to the testing team concept. Third, rather than attempt to test all of the children in seventeen target villages (ASOSS, BIA and comparison) a stratified random sample was selected to minimize the loss of classroom instruction time for testers as well as students. And fourth, the testing was limited to a single posttest period, since the degree of initial

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comparability of comparison and bilingual schools had been satisfactory established in prior evaluation years.

Instruments

The instruments used for the present evaluation fall into two main categories, (1) academic - Yupik literacy skills, and numerical skills, and (2) linguistic - acquisition of grammar in Yupik and English and acquisition of meaning in Yupik and English.

The measurement of Yupik literacy skills was divided into three main categories: (1) prereading, (2) decoding, and (3) encoding. The measurement of prereading skills consisted of the (a) recognition of initial letter sounds, (b) the visual discrimination of symbols, and (c) reading phonemes.

The measurement of Yupik decoding skills consisted of (a) reading sight words, (b) decoding new words, (c) matching words with pictures, and (d) reading and following simple directions.

Thus, the measurement of decoding skills is designed to assess not only simple decoding performance as in (a) and (b), but also the child's ability to attach recognition meaning to the symbols he decodes, as in (c), and behavioral meaning as in (d).

The measurement of encoding skills assessed three levels of written performance: (1) ability to write the alphabet (appropriate to Yupik or English), (2) ability to encode Yupik sounds and words, and (3) formal performance in which the pupil writes about himself.

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Measurement of numerical skills consisted of two main components. The first focused on the ability of the children to use names of numbers for counting, and the second focused on the ability of the children to perform a variety of arithmetic calculations.

Counting skills were assessed in three parts: (1) oral counting, (2) recognition of numbers, and (3) counting objects.

The second component of numerical skills measurement consisted of basic arithmetic comprising simple addition, substraction, and multiplication.

For the broad purpose of assessing comparative linguistic changes in program and nonprogram children, two subtests of Illinois Test Psycholinguistic Abilities (ITPA) were adapted, -- The Grammatic Closure, and the Auditory Association subtests. According to Kirk et al., (1968)[1] the Grammatic Closure subtest:

> ... assesses the child's ability to make use of the redundancies of oral language in acquiring automatic habits for handling syntax and grammatic inflections. In this test the conceptual difficulty is low, but the task elicits the child's ability to respond automatically to often repeated verbal expressions of standard American speech. The child comes to expect or predict the grammatic form so that when part of an expression is presented he closes the gap by supplying the missing part. The test measures the form rather than the content of the missing word, since the content is provided by the examiner. (p. 11)

The Auditory Association subtest:

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[1] Kirk, S. A., McCarthy, J. J. and Kirk, W. D., Examiner's Manual: Illinois Test of Psycholinguistic Abilities, University of Illinois Press, Revised Edition, 1968.

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> ... taps the child's ability to relate concepts presented orally. In this test the requirement of the auditory receptive process and vocal expressive process are minimal, while the organizing process of manipulating linguistic symbols in a meaningful way is tested by verbal analogies of increasing difficulty. A sentence completion technique is used, presenting one statement followed by an incomplete analogous statement, and allowing the child to complete the second statement appropriately. (p. 10)

These two tests, as published, are designed to deal with verbal output at two different levels of language organization. By adapting the stimulus material to the familiar locale of the Eskimo child, and adapting by translation the verbal content of each test item it was hoped that similar processes would be measured in children affected by the bilingual education program. To be sure, the difficulty of achieving a perfect adaptation of both the visual stimulus material and the verbal item content is great and as many steps as possible have been taken to assure appropriateness within the given situation.

The test adaptations were made in conjunction with personnel of the Eskimo Language Workshop, whose task it was to modify test pictures to the local environment, translate item content into meaningful tests of grammatical structures, and provide back-translations for use in corresponding English language items. In most cases the English version is not a direct literal translation of the Yupik, but has been readapted to make the syntax meaningful as a test item.

For both the Grammatic Closure and Auditory Association tests, the Yupik and English versions were administered separately.

Table 1 summarizes the preceding description for quick reference by the reader. Included in Table 1 are combinations of subtest components used in the final statistical analysis. For example, a total prereading score was obtained

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TABLE 1

SUMMARY OF EVALUATION TESTS BY GRADE LEVEL

ABILITY TESTED	INSTRUMENTS	NUMBER OF SUBJECTS BY GRADE LEVEL								
		LEVEL ONE			LEVEL TWO			LEVEL THREE		
		BIA	ASOSS	COMP	BIA	ASOSS	COMP	BIA	ASOSS[b]	COMP
Literacy Skills:	prereading initial letter sounds +visual discrimination of symbols +reading phonemes	31	30	19	31	30	19	15		15
Decoding:	reading sight words with pictures +decoding new words +matching words with pictures +reading and following directions	31	30	19	31	30	19	15		15
Encoding:	alphabet	31	30	19	31	30	19	15		15
	sounds and words	31	30	19	31	30	19	15		15
	free essay	31	30	19	31	30	19	15		15
Number Skills:										
Counting:	oral counting +naming numbers +counting objects	31	30	19	31	30	19	15		15
Arithmetic:	arithmetic	31	30	19	31	30	19	15		15
Linguistic Skills:										
Grammar Closure:	Yupik	31	30	19	31	30	19	15		15
	English	18[a]	30	19	18	29	19	15		15
Auditory Association:	Yupik	31	30	19	31	30	19	15		15
	English	18	30	19	18	30	19	15		15

a. For some unaccountable reason, one tester did not administer English versions of the Grammatic Closure and Auditory Association Tests, reducing the number of subjects from 31 to 18 both in grades one and two in BIA schools.

b. Level three classrooms were not added to ASOSS bilingual program school until 1973-74.

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by combining its three subtest components; initial letter sounds, visual discrimination of symbols, and reading phonemes. In most cases, subtests were combined where it would ease the burden of statistical calculations, provided there was reasonable homogeniety of content. In cases where subtests are not combined it was felt the subtests either were measuring divergent skills (e.g., numerical skills) or used measurement scales too varied to permit combination without undergoing time consuming statistical scale transformations (e.g., encoding). The resulting combinations of tests and subtests summarized in Table 1 provide a total of eleven units for statistical analysis.

Testing Procedures

All tests were administered by experienced Yupik bilingual teachers recruited from the ASOSS and BIA bilingual program. Testers were selected according to four major criteria: (1) personal interest in the testing program, (2) recommendation by principal teachers involved in the program, (3) availability for travel to a training workshop, and (4) assent by the majority of bilingual aides. Of the eight selected, three had prior experience as testers in earlier evaluation activities.

The testers received the main portion of their training at a three-day workshop held in early March, 1973, at the Bureau of Indian Affairs site in Bethel. During the three days, general testing concepts such as measurement and random sampling were assimilated as well as specific administration procedures. In addition, the testers gave substantial input into the final structure

of the tests, developed scoring criteria, and laid the groundwork for the math test to be used in the program.

Following the workshop, final production of the tests was completed, a final testing schedule was developed, and a random sampling plan was finalized including the village assignments for each tester. Travel arrangements were coordinated locally by BIA and ASOSS area administrators. With few exceptions the testing program was carried out satisfactorily. The few exceptions were the result of unforeseeable local conditions requiring immediate decisions by the particular tester out of communication with the evaluator. In one case (see Table 1, footnote) there was a significant loss of data, but even then the ability to draw data-based conclusions was not seriously jeopardized.

Data Analysis

The analysis procedure used throughout was the method of t-test for differences between independent group means. To explain further, the t-test provides an estimate of the probability that two group means could differ an observed amount simply by change. A decision can thus be made whether or not to place confidence in the effectiveness of a program. This is done by rejecting or not rejecting the idea that a particular test result comparing a group of programs with a group of nonprogram children, could have happened as a result of chance or luck. For example, if a t-test shows that a difference between two group means could be expected to happen by chance not less than twenty times in a hundred (i.e., with the probability (p) greater than .20)

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we would fail to reject the notion that the difference was due to chance and thus have little confidence in the idea that the program was effective. If, however, a t-test shows that the means could differ by chance fewer than five times in a hundred ($p < .05$), we will have reached a commonly accepted standard for rejecting the idea of chance differences and therefore be able to have confidence that the program was indeed effective. Of course, the same decision rules hold for cases in which the comparison group does better than the program group. Such cases are shown in the results as negative t-test scores.

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CHAPTER III

Evaluation Findings

This chapter presents the major findings under the three annual evaluation plans described in chapter two. Up to now there has been no need to distinguish between ASOSS and BIA programs because their evaluation designs were essentially the same. The results of each agency's program, however, were obtained separately and are so presented here for each program year. Because of the methodological problems encountered in the second year evaluation design, the results for that year are presented with less specificity than for the first and third year programs.

First Year Results

So the reader can quickly reference results to the evaluation questions presented earlier, Table 2 summarizes the general scheme of the first year external evaluation design. As stated before, the evaluation objectives were to assess: (a) the initial comparability of bilingual and comparison schools at the beginning of the school year, and (b) relative gains made in each type of school during the school year.

Initial Comparability

Table 3 summarizes the findings on the initial comparability of the Experimental and Comparison groups in Bethel and the surrounding villages participating in the program. As can be seen, the only test on which groups were

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Table 2
Evaluation Questions, Relevant Data and Analyses, and Relation of Analyses to Questions, for First Year External Evaluation of Bilingual Program

Evaluation Questions	Relevant Data and Analysis	Relation to Analysis to Question
How do the Experimental (bilingual) classrooms and Comparison (traditional) classrooms compare at the beginning of program operation?	Data: Pretest scores on RCPM, YRV and ERV tests. Analysis: t-tests for differences between independent means of Exp. and Comp. classrooms. Bethel and village classrooms are analyzed separately.	A significant difference between the means on a given test would indicate groups were not initially comparable and subsequent gains on posttestings would need to be interpreted accordingly.
How do the Experimental classrooms and Comparison classrooms compare at the end of the first year of program operations?	Data: Posttest scores on YRV and ERV tests. Analysis: t-tests for differences between independent means of Exp. and Comp. classrooms. Bethel and village classrooms are analyzed separately.	The significance of the differences between means will be interpreted in light of the initial comparability assessed in Question 1, e.g. if groups were different on pretest but comparable on posttest it would indicate greater relative growth for the group lower on the pretest.
What evidence is there of relative vocabulary growth in the two program languages, (Yupik and English) for Experimental and Comparison classrooms?	Data: Pre and posttest scores on YRV and ERV test, paired for each child. Analysis: t-tests for differences between correlated means of Exp. and Comp. classrooms. Bethel and village classrooms are analyzed separately.	The significance of the difference indicates the magnitude of growth within each group. These magnitudes may then be compared across groups.
Is there evidence for greater vocabulary growth in Experimental classrooms relative to Comparison classrooms?	Data: Gain scores (the difference between pretest and posttest scores for each child on YRV and ERV tests). Analysis: t-tests for independent means (one-tailed) comparing gains in Experimental classrooms with those in Comparison classrooms.	A significant difference in the hypothesized direction, that Experimental Ss have higher difference scores (D = posttests - pretest score), would indicate greater gains for pupils in the bilingual program.

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uniformly similar was the Raven Coloured Progressive Matrices. This suggests the general level of intellectual potential is fairly stable throughout the area. The important thing is that none of the groups are relatively different in this regard, obviating the need to make complicated statistical adjustments. These adjustments may have proven difficult at best and perhaps inconclusive at worst were differences from group to group to have appeared on the RCPM since this measure was included to account partially for individual but not group achievement.

An interesting contrast is seen between the Bethel groups (Experimental and Comparison) and the village groups on the Yupik Receptive Vocabulary (YRV) test. In the villages the Experimental and Comparison groups are not different whereas in Bethel there is a considerable difference between the two

Table 3
Comparability of Experimental (E) and Comparison (C) Groups on Ravens (RCPM), Yupik Receptive (YRV), and English Receptive (ERV) Vocabulary Pretests

	RCPM			YRV			ERV		
	t[a]	p[b]	decision	t	p	decision	t	p	decision
Villages	.19	N.S.	Exp. = Comp.	.11	N.S.	Exp. = Comp.	2.33	.025	Exp. < Comp.
Bethel	.63	N.S.	Exp. = Comp.	3.61	.005	Exp. < Comp.	1.90	.05	Exp. < Comp.

a. t-test for difference between independent means.
b. p is the probability such a value could have occurred by chance. N.S. means no significant, i.e. could have easily occurred by chance. Probabilities under .10 are considered not significant.

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groups. This finding reflects the difference in the way children were selected to participate in their respective programs. In Bethel individual parents were given the choice whether their child would participate in the bilingual kindergarten or the traditional one. It seems clear now that much of the choice was on the basis of language (or even cultural) factors. Many of the children selected into the bilingual classroom were more adept speakers of Yupik. By contrast, in the BIA bilingual program, whole villages were designated to comprise experimental or comparison groups on the basis of initial interest, availability of potential trainees, and administrative choice. This, coupled with the fact thai there are relatively few non-Yupik-speaking families in the villages compared with Bethel, would lead one to predict greater intervillage homogeniety in native language experience of the village residing young people.

Finally, there was a strong tendency for the Experimental groups to score lower on the English Receptive Vocabulary (ERV) test relative to the Comparison groups. This finding should not be surprising in Bethel given the selection factors noted above. Why this should be so in the villages is not clear unless the factors associated with the selection of the particular villages were based somewhat on the relative lack of English language skills perceived by the program planners. From the standpoint of the evaluation design there is little harm introduced by noncomparability on either of the vocabulary tests. In fact, it affords a good chance to test either program's capacity for reducing the initial gap.

Evidence for Gains

As summarized in Table 2, there are three viewpoints by which to assess the growth of Yupik and English vocabulary in the bilingual and traditional classrooms. The first view (Table 4) shows growth within each kind of classroom; bilingual and traditional, but doesn't compare them statistically on final achievement level relative to one another. The second view (Table 5) shows the comparative achievement levels of the two kinds of classrooms, but makes no direct statistical analysis of the amount of growth during the year. With Tables 4 and 5 taken together, however, some idea can be gained as to whether one group "caught up" with another. The third view (Table 6) shows by direct statistical comparison whether one kind of classroom made greater score gains than the other; perhaps the most interesting view of the three.

Table 4 shows general growth in both kinds of classrooms, especially in English vocabulary. All groups show a significant difference between pre and posttest scores on English Receptive Vocabulary. On Yupik Receptive Vocabulary the only group showing no significant difference between pre and posttest scores was the Bethel Comparison group. As was pointed out earlier, however, many of the children in this group do not have Yupik available as a first language and therefore should not be expected to gain Yupik vocabulary during the year, especially under conditions where their parents have made a choice not to reinforce their development of the area vernacular.

Table 5 shows the relative achievement of the two kinds of classes on Yupik and English Receptive Vocabulary. In English the two kinds of classes

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Table 4
Results of t-tests for differences between pre and posttest scores within Experimental and Comparison groups, on Yupik Receptive (YRV), and English Receptive (ERV) Vocabulary tests.[a]

	YRV					ERV				
	$\bar{X}$ pre	$\bar{X}$ post	r pre-post	t[b]	p	$\bar{X}$ pre	$\bar{X}$ post	r pre-post	t	p
Villages:										
Exp.	62.2	68.1	.41	5.10	.001	44.8	49.0	.38	4.60	.001
Comp.	63.1	66.5	.37	3.10	.005	47.8	50.3	.78	4.23	.001
Bethel:										
Exp.	50.8	58.2	.72	3.49	.005	54.5	59.9	.77	5.27	.005
Comp.	36.8	37.8	.97	0.64	N.S.	56.3	59.0	.92	3.26	.01

a. results based on the following numbers of pupils for whom both pre and posttest scores were available: Village (E), N = 29; Village (C), N = 33; Bethel (E), N = 8; Bethel (C), N = 8.
b. t-test for non-independent means.

Table 5
Results of t-tests for posttest comparability of Experimental and Comparison groups on Yupik Receptive (YRV), and English Receptive (ERV) Vocabulary tests

	YRV			ERV		
	t	p	decision	t	p	decision
Villages	1.05	N.S.	Exp. = Comp.	1.16	N.S.	Exp. = Comp.
Bethel	3.39	.005	Exp. ≠ Comp.	0.61	N.S.	Exp. = Comp.

in the villages as well as in Bethel are shown not to be significantly different at the end of the school year. In light of the initially discrepant status of these groups, reported in Table 4, this result indicates the bilingual classes have achieved parity--have caught up with their traditionally educated counterparts. Interestingly enough, the difference between the village Experimental and Comparison groups in Yupik Receptive Vocabulary scores is in a direction favoring the bilingual classes, but the difference is not significant. The third view, discussed below, sheds some additional light on the issue. In Bethel, the difference between the Experimental and Comparison groups on the YRV remains significantly wide on posttesting and as can be deduced from Table 5, is probably in the process of becoming progressively wider.

Finally, Table 6 shows that score gains made on both tests during the school year are significantly greater in the bilingual classrooms than in the traditional classrooms. This result occurred for both vocabulary tests, in the villages, as well as in the Bethel Kindergarten.

Discussion

Based on the results of the external evaluation of the bilingual program's first operational year there seems reason enough for the program planners, administrators, teachers, and pupils to have exercised optimism for the future.

Encouragement as to the potential for this kind of approach can be taken from two important signs. First, there is strong evidence (Table 6) that the program generally accelerates the growth of native language vocabulary in the

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Table 6
Results of t-tests of difference between means of gain scores (post minus pretest) for Experimental and Comparison groups on Yupik Receptive (YRV) and English Receptive (ERV) vocabulary tests.[a]

	YRV				ERV			
	Mean Gain for Exp.	Mean Gain for Comp.	t	p[b]	Mean Gain for Exp.	Mean Gain for Comp.	t	p
Villages	5.90	3.44	1.80	.05	4.20	2.50	1.88	.05
Bethel	7.50	1.00	2.68	.01	5.38	2.75	1.99	.05

a. results based on the same numbers of pupils as in Table 4.
b. one-tailed test of significance.

age and grade groups it touches. Second, there is equally strong evidence (Table 6) for a similar acceleration in the growth of English language vocabulary.

The claim here is not that vocabulary-building is the central objective of education, nor that it is the sum total of language development. It is considered only as an external marker of some kind of broad change process going on in the child as he develops the skills necessary to engage in communication with other people in his world. The measurement of vocabulary development is a valid and economical way of monitoring that change process and enables others to make reasonable judgments as to the impact of experiences associated with

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vocabulary growth. Bilingual instruction is designed to be just such an experience and, to the extent of its influence, changes in the rate and level of vocabulary development monitor the program's impact on the language of the child.

The fact that the rate of acquisition of English vocabulary is accelerated by the bilingual program speaks to a very immediate issue relevant to the acceptance of the entire program concept. The reservations most often expressed by potential recipients of a bilingual program is that the children are going to get behind, "lose ground" in their ability to use English and thus will be retarded in their capacity for participating in the mainstream of the dominant culture. That such retardation doesn't seem to exist--on the contrary, acceleration is more likely the case, was probably the most important finding for external evaluation at that early stage of the bilingual program.

Before going further, a few words of caution are in order, not to temper the reader's enthusiasm so much as to help him establish a perspective for realistic judgment of the first year program results.

First, this program was new and with it came all the hopes and expectations for success that attend any new program. The supportive, even enthusiastic, reception of bilingual education by the native people, while necessary to the program's early survival, opens the door to the well known self-fulfilling prophecy phenomenon. Newness and innovation in education programs may tend to breed their own early success through the fervor of youthful enthusiasm.

Second, the bilingual classrooms were staffed with more teachers, had more new materials, and more new equipment than the classrooms serving as

a traditional comparison. How much of the growth in the children was due to extra attention, not just a new kind of attention? We don't know yet.

Third, there was too much incomplete data in the Bethel sample, in both classrooms, and it is not known what the extent of bias existed in the loss. Probably, the bias was constant for both classrooms, but that cannot be guaranteed entirely.

Fourth, not all the bilingual schools were outstanding nor the traditional schools deficient. Only broad group gains have been reported and while a clear edge was shown for the bilingual schools it must be recalled that pupils in schools designated as traditional showed significant growth also. The evidence in this report was never designed to support the outright condemnation or commendation of any educational approach, old or new.

Finally, it should be pointed out that we have met certain criteria of statistical significance only. Ecological significance, meaning major observable changes in the social, cultural, and economic life of the communities served by bilingual education, is a different matter. Only with the passage of time can the expected impact of the program be evaluated in the lives of its students and its teachers.

Second Year Results

Despite the methodological problems noted earlier in chapter two, there are some broad conclusions to be drawn from the second year evaluation results. There findings are summarized here to afford a degree of continuity between

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the more detailed first and third-year discussions, and to raise some questions to which the third year results might be addressed, albeit in retrospect.

Probably the most important trend in the second year of the program was the tendency for newly added grade levels to taper off in performance. That is, children who were experiencing their second year of bilingual programming did not show the strong performance relative to comparison pupils demonstrated in their initial year. This was true of the second grade classes in the BIA schools, as well as in the first grade in Bethel. In neither case could a clear performance edge be shown.

For children in Bethel, reduced performance gains were seen in comparison to the scores they had obtained at the end of their kindergarten year. In short, they were right where they left off the year before. Unfortunately there are no adequate comparison groups for the Bethel situation since so many uncontrolled selection factors operated to place children in the Bethel bilingual classroom. In fact recent information has come to light indicating many of the children were placed in Bethel's first bilingual classroom because they needed special help in one form or another. Selection for special programs, of course, is not unusual nor even unwise from the standpoint of educational management, but does make inconclusive the long-range evaluation findings for the role of bilingual education in Bethel. Nevertheless, the general first-year findings in Bethel remain to a great extent, that the children, even though many of them may have had substantial learning, social, or enculturation problems to begin with, made undeniable gains in their kindergarten experience. But the

long-range evaluation for Bethel remains so clouded that no further attempts have been made to obtain comparative data for objectively assessing the validity of bilingual education for the Bethel community. Its role in the school program must rely solely on the judgments of the school personnel and the attitudes of the community.

Returning to the general picture, the tapering off in performance seen in the BIA second grade classroom warrants further comment. This finding may well have been part of a general pattern for pupils finding themselves at the "leading edge" of a new but not fully developed program. That is, being in the grade level newly added to the program, the second grade pupils in the second year of program implementation were subject to a necessarily experimental, transitional, and sometimes half-formed curriculum. Furthermore, they were in the second year of such a process, which may have had a cumulative detrimental effect on them.

Two kinds of evidence seem relevant to whether the above hypothesis carries adequate weight in explaining why after the promising beginning, performance should fall off. First, if this "leading edge" explanation has merit, the same children should show a similar falling off in performance in the third year evaluation results. Such evidence is analyzed in the next section of the present chapter. Second, children in grades following the initial group should, if the above explanation is valid, show an improved performance level restored to increased rates of gain relative to comparison pupils, perhaps even over and above the base line rates established in the very first program year. Again,

the next section shows results relevant to this hypothesis. And, more to the point of the second year evaluation results for the first grade levels, the results showed substantial gains in both Yupik and English between pre and posttesting periods relative to comparison scores such as could be obtained within the context of methodological problems described earlier.

In summary, the second year program appeared to have been a mixture of successes and nonsuccesses, combining a good deal of error with trial to gain substantial bilingual programming experience at all phases of operations.

Third Year Results

As before, the analysis statistic used in the third year was the method of t-test for differences between independent group means.[1] To explain further, the t-test provides an estimate of the probability that two group means could differ an observed amount simply by chance. A decision can thus be made whether or not to place confidence in the effectiveness of a program. This is

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[1] The t-test for independent means proceeds as follows:

$$t = \frac{\bar{X}_B - \bar{X}_C}{S_{\bar{X}_B - \bar{X}_C}}$$

Where: $\bar{X}_B$ is a mean score for a bilingual group

$\bar{X}_C$ is a mean score for a comparison group, and

$S_{\bar{X}_B - \bar{X}_C}$ is the standard error of the mean difference,

estimated from the two sample variances. The resulting t value is compared with tabled t values for various sample sizes. For a more detailed treatment of the t statistic the reader is referred to Edwards, A. L., Experimental Design in Psychological Research, Holt, Rinehart, and Winston, New York, 1963, Chapter 7 and 8.

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done by rejecting or not rejecting the idea that a particular test result, comparing a group of programs with a group of non-program children, could have happened as a result of chance or luck. For example, if a t-test shows that a difference between two group means could be expected to happen by chance not less than twenty times in a hundred (i.e., with a probability (p) greater than .20) we would fail to reject the notion that the difference was due to chance and thus have little confidence in the idea that the program was effective. If, however, a t-test shows that the means could differ by a chance fewer than five times in a hundred ($p < .05$), we will have reached the commonly accepted scientific standard for rejecting the idea of chance differences and, therefore, be able to have confidence that the program was indeed effective. Of course, the same decision rules hold for cases in which the comparison group does better then the program group. Such cases are shown in the results as negative t-test scores.

The results of the statistical analysis are presented in three main sections: (1) literacy skills, (2) numerical skills, and (3) linguistic skills. In each section the general results are described, followed by a brief discussion of the overall patterns in the results taken in total.

Literacy Skills

Table 7 shows the results of the statistical analysis of performance in literacy skills for each grade level. The reader is reminded that the values for t are the best index of comparative performance since they indicate whether a particular mean difference between a bilingual and comparison group should be

Table 7
Literacy Skills in Yupik

	Prereading			Decoding			Encoding								
							Alphabet			Encoding Sounds			Open Essay		
	Bil.	Comp	t	Bil.	Comp	t	Bil.	Comp	t	Bil.	Comp	t	Bil.	Comp	t
BIA Level One	15.20	9.70	3.20**	13.94	1.16	6.09**	65.39	70.94	-.57	31.65	1.26	4.44**	5.61	2.42	2.59*
ASOSS Level One	15.71		4.29**	14.12		4.66**	63.13		-.86	44.50		3.89**	5.13		2.02*
BIA Level Two	14.97	11.95	2.32*	17.45	1.53	6.03**	82.22	83.10	-.12	48.06	.26	5.33**	7.97	7.58	.28
ASOSS Level Two	17.42		4.84**	20.25		7.46**	84.84		.28	52.87		7.11 **	10.77		2.17 *
BIA Level Three	15.87	14.83	.99	18.73	4.07	4.25**	88.87	98.67	-3.45**	57.13	3.47	4.69**	8.00	14.10	-3.11 *

* $p < .05$
** $p < .01$

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taken seriously, i.e., represents a significant program difference. Negative t values indicate a higher comparison group mean.

Beginning with prereading skills the performance of the bilingual program children was substantially superior. This superiority was most marked in grades one and two. By level three, both bilingual and comparison groups were about equal but this may have been largely due to the test having too little ceiling, leaving no more room for improvement. The important result is that first grade performance is high, giving evidence of a good beginning in Yupik literacy, comparable to what might be expected by the third year in the traditional program where the children must rely on their ability to generalize from what they have learned in English literacy training. In Yupik decoding skills, the bilingual program children show clear superiority at every grade level.

In encoding, a rather mixed picture of performance has taken shape. While the ability of the bilingual program to establish the concept of the written alphabet is weak, (especially at level three) the ability of the children to encode Yupik sounds and words successfully is quite strong at every level. Relative skill at free written expression being strong in bilingual at levels one and two, but then appears to fall clearly behind by level three. In fact, many of the level three children made no attempt to write anything at all.

The reader should bear in mind that the purpose of evaluation in this section was to assess the degree to which the bilingual classroom is able to prepare Yupik speaking children to be literate in their first language. Using the traditional classroom as an estimate of what might have happened otherwise,

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makes relatively clear the general success in meeting this goal. The only exceptions are in areas in which children in comparison schools were not restricted by the tests from relying on English as a mode of written expression. In all other cases, virtually no generalization from English to Yupik was in evidence by children in the traditional program. It would, of course, be unfair to say that no literacy skills in English are being developed in the traditional schools since evidence in that domain was not gathered so there would be no way to support such a conclusion one side or the other.

It does seem certain that a concept of the alphabet is not necessary for other basic encoding operations, particularly in the accurate formation of sounds and words received aurally. The bilingual children do find without it and the traditionally taught children are at no apparent advantages possessing it (recall that spelling was not considered in judging the free essay). Perhaps teaching an alphabet is more for the reinforcement of the teacher than of the pupil and hence constitutes an unnecessary part of the curriculum. In fact, trying to establish an alphabet concept early may only lock the child into an ungeneralizable system which later the child is required to repudiate upon second language literacy training.

Numerical Skills

Table 8 shows the test results for assessing comparative numerical skills. Two components were tested; a component comprising counting and number identification (naming) skills, and a component comprising common arithmetic calculations. In the former, counting, the comparison groups performed as

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Table 8
Comparative Number Skills

	Math Component Scores					
	Counting			Arithmetic		
	Bil.	Comp.	t	Bil.	Comp.	t
BIA Level One	31.00	40.08	-3.16**	2.50	2.10	.52
ASOSS Level One	38.70		-.63	6.50		3.78**
BIA Level Two	37.10	50.50	-5.40**	7.40	5.10	2.09*
ASOSS Level Two	48.00		-1.06	10.73		3.75**
BIA Level Three	34.50	56.30	-6.49**	10.70	10.90	-.10

* $p < .05$
** $p < .01$

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well or signficantly better than their bilingually taught counterparts at each of the three grade levels. However, in arithmetic calculations, the bilingual program children performed as well or better than the comparison school children.

Problems in establishing a Yupik math curriculum were present since the program's beginning. First of all, there existed no standard treatment of math controlled throughout the bilingual program schools. For example, program schools varied in the time at which English names for numbers were introduced. Second, most Yupik counting systems are developed on metric using a base other than the base ten, necessitating highly complex transformations into the English base ten system. For number below 20 or 30, there is generally no difficulty, but numbers greater than 30 begin to possess long and linguistically complex names which, therefore, are mathematically different from their English equivalent.

Why then should arithmetic calculations pose no apparent problem to bilingually taught children given the difficulty they seem to have counting? One possible reason is that the arithmetic problems used in the present evaluation were, like most arithmetic operations, approachable by reduction to single integers. In fact, even into secondary school most math calculations are taught to be performed by reducing them to single digit operations. This may be why the children in the bilingual program can handle calculations reasonably well without apparent facility with large number concepts. However, it follows that when such concepts become necessary at some later time the children in the

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bilingual program may well have problems developing the necessary abstractions to go beyond simple arithmetic with any notable facility. This evidence calls for serious consideration to refining the Yupik math curriculum, materials development, and teacher preparation to make them more adequate to deal with the long range competence requirements of the bilingually taught person.

Linguistic Skills

Linguistic skills in each language were measured in two ways, one stressing the acquisition of grammar and syntax, and the other stressing the understanding of meaning in the context of analysis, ranging from simple to relatively complex.

Referring to Table 9, in Yupik the quality of performance in grammatical use is clearly greater at grades one and two for the bilingual program students, with the trend carried, though more weakly, into grade level three. In their ability to deal with meaning in Yupik, the bilingual program children show significantly better performance at all three grade levels.

In English grammatic development there is generally strong performance by bilingual program children in the first two grades which tapers off in later primary so by level three the bilingual students are still holding their own but not showing the distinct advantage they began with. The development of facility with meaning in the English language is essentially equal for both groups until level three where the comparison students show clear superiority.

It should be noted that of the two English tests, Grammatic Closure measures the abilities most stressed in the English as a Second Language (ESL)

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Table 9
Comparative Linguistic Scores

	Yupik						English					
	Grammatic Closure			Auditory Association			Grammatic Closure			Auditory Association		
	Bil.	Comp.	t	Bil.	Comp.	t	Bil.	Comp.	t	Bil.	Comp.	t
BIA Level One	18.65	11.79	4.23**	15.32	8.32	4.05**	4.72	2.68	2.65**	5.22	5.11	.08
ASOSS Level One	16.47		2.10*	13.57		2.16*	8.46		10.70**	9.79	5.40	2.71**
BIA Level Two	19.26	14.21	3.63**	18.19	13.16	2.89**	6.11	4.53	1.34	9.06	8.74	.20
ASOSS Level Two	20.79		2.53**	19.27		2.50**	11.36		4.30**	14.72		3.42**
BIA Level Three	20.73	18.60	1.06	21.60	18.20	1.95*	8.47	8.53	-.04	12.27	16.60	-2.35**

* $p < .05$
** $p < .01$

portions of the bilingual program curriculum, and this is where the stronger performance was noted, especially in early grades. This finding may indicate that the ESL component of the program is successful but only within a limited range of intended outcomes relative to what happens temporarily within the traditional program where the weight of exposure to English apparently accumulates by the third year or so. By this logic it is reasonable to predict that the early basis in English grammar and syntax, and gains in language development in Yupik will show a cumulative effect when increased exposure to English takes place in the postprimary years.

General Discussion

The most striking pattern to emerge from the data taken in aggregate is the marked tendency for the level three performance to show a sizeable drop. The reader will recall from part two of the present chapter that the same tendency was shown in the second year of the program when the present level three students were at level two. A theory was advanced earlier that the phenomenon may have been due to a lag in program development when each new level was added. To that theory may be added another, given the currently discussed evidence.

The earlier theory may still hold. In fact, the greater strength of performance of level two children the following year lends support to this line of speculation since it now appears as though the level two curriculum had taken shape well enough to meet at least the immediate instructional goals. At the same time the newly added level, level three, showed the same evidence of tapering off that level two did when it was first added to the bilingual program design.

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But a supplemental theory also warrants consideration. The performance drop could also be due to a relatively low ability level of the particular children comprising level three, caused directly by their being the vanguard of the new movement so when a new grade level is added to the program, they are "it". That is, these children maybe showing a cummulative effect of being in the experimental forefront of the bilingual implementation period. This theory should not be discounted in explaining the data patterns seen this year and last.

Of course, there are other theories to account for this data, not the least of which is the possibility of sampling error. A random sample cannot guarantee a representative cross-section of pupils selected for testing. It can only guarantee all pupils an equal chance of selection. With small samples, the probability of selecting from the low end of greater than with the larger samples. But, the probability is just as great for selecting from the top end, and with limited time and resources, these risks must be taken. While the sampling error theory is logically as sound as any other, it would be impractical to place great faith in it since it has no implications for program development. Of the two theories posed above, the one that demands consideration from a practical point of view is the first because it asks for program review by its developers and practitioners to help make sure the third level achieves a sound functioning basis.

A fourth theory, of course, is that the total concept of bilingual education is questionable and may not come through on its initial promise to provide a

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quality educational program for Yupik speaking children. But such a theory is easily weakened by the remarkable performance of children in the early primary grades experiencing the bilingual classroom.

In summary, it seems apparent that the children in the bilingual program are gaining a sound basis in nearly all aspects of Yupik literacy, Yupik and English oral language proficiency, and academic performance. Areas of weakness noted above can, in the evaluator's opinion, be strengthened through direct attention to specific portions of the curriculum some of which are addressed in the next chapters.

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CHAPTER IV

Issues in Bilingual Programs

The chapter relates what the author considers the main issues arising during the first three years of bilingual program evaluation. By issue is meant the emergence of a problem more or less serious and more or less unanticipated prior to the implementation of the program for which apparent controversy or lack of solution exists at the time it arises and possibly after. These issues are presented in the context of the four main program components; 1) instruction, 2) staff development, 3) materials development, and 4) community involvement. For each issue as much historical background is given necessary to understand why it is an issue, followed by a description of attempts to reconcile various positions and, where appropriate, the evaluator's perception of the overall implications the issue holds for the future of bilingual education in Alaska. The reader is reminded that these issues have been selected by the author according to his perceptions as program evaluator and as such are not necessarily comprehensive of all problems which others equally close or closer to the bilingual education process might perceive as important. Furthermore, because there are two agencies involved in the report not all of the issues apply equally to both. Except where obviously needed for clarity no attempt will be made to differentiate programs, keeping them under one general umbrella.

Instruction Component

Issues arising in the instruction component fall mainly in the realms of the instructional objectives, the instructional process, and the curriculum content.

Instructional Objectives

The use of instructional objectives for planning the day-to-day, year-to-year scope of a school program is rapidly assuming gospel importance throughout modern education. The instructional objective is a verbal device for specifying precisely what is intended to happen in the classroom at any given time. There are different types of objectives for planning the process of instruction, i.e. what kind of method or strategy will be used to accomplish an education outcome, and for planning the products of instruction, i.e. as implied by the performance of the child undergoing the instructional process.

The federal agencies funding Alaska's Yupik bilingual education programs have at one time or another insisted that all instructional activities be described ahead of time in the standard rhetoric of objectives. The evaluator participated in national conferences held by the federal agency responsible for ASOSS program funding in which the principal aim was clearly to bring all aspects of bilingual program management, operation, and evaluation under the control of appropriately worded process and product objectives prior to the program's implementation. The evaluator's interpretation of the role sought for instructional objectives in the program has three parts. First, objectives were

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to be a basis for planning all program activities. Second, instructional objectives were to be a management tool by which the evaluator could organize the collection and reporting of information regarding the progress of all program activities. Third, objectives were to serve as program guides in the classroom so all personnel would know what was expected of them.

Within the first year of bilingual programming, confusion over the use of instructional objectives became quite apparent at all program levels. In order to analyze the problem it is necessary to keep in mind that the three purposes stated above are interrelated, not separate functions. Drawing from material included from previous evaluation reports, a number of points of analysis seem appropriate. First, however, for the reader's background it should be pointed out that the program referred to, the ASOSS Title VII program, began from a request for funding listing over 50 specific product objectives for Yupik, and an identical set in English, in the instructional component alone. The required existence of these lists in the evaluator's opinion gave rise to much of the confusion over the role of objectives. Why this confusion, is the subject of the following aside.

First, it would be well to conceptualize a plausible set of reasons why weak performance might be shown with regard to any particular objective. Each kind of reason requires its own strategy by which it might be adjusted for in the education programs.

First, failure to meet a particular performance objective may be due simply to the fact that the instructional process did not include, intentionally or otherwise,

the ingredients necessary for meeting it. Given such a reason for failure to meet an objective, two courses of action might be considered. One might drop the objective from the intentions of the program and substitute an objective which better parallels the teacher's intended instruction. Or, conversely, instructional processes may be added to the program so performance deficit might be met. The decision, whatever it is, must represent a synthesis of information from all program spheres; field personnel as well as program planning staff.

A second reason may be that the ingredients were in the instructional process but not well formed or given an adequate amount of time, or deferred to a later period of pupil growth. Such circumstances would require an intensive review of the instruction process and its relationship to the developmental characteristics of the children targeted by the program. Appropriate modifications with planned re-evaluation of any instruction innovation should then be built into the system.

A third reason an objective is not reached may be that the instruction ingredients were included in the program, well executed by the teacher, with plenty of time devoted to them but were simply beyond the grasp of the pupils in the program. Under this condition, there seems to be two other possibilities. One is that the material is not within the scope of the pupil's acquisition skills for known or unknown cultural reason. An example of such a reason might be that the particular curriculum materials were outside of the scope of cultural knowledge of the child. Another possibility is the presence of an achievement

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deficit known to exist in village situations for many years: for example, the achievement of proficiency in the standard use of English grammatical structures; such deficits which indeed constitute the very reason for the existence of the bilingual program. In such a case, it may be the task of the bilingual program to make up the deficiency over a period of years before children can be expected to perform at a normative age-grade level. An appropriate course of action might be to wait until other widespread changes expected from the bilingual program have accumulated to overcome the deficit which before existed, e.g. it may take years before enough older brothers and sisters, through exposure to ESL, become models to incoming younger children for the production of standard English.

Table 10 gives examples of objectives for which relatively low performance was obtained in the first two quarters of the second year of the program. Each of these objectives is discussed briefly with a suggestion as to possible courses of action for program planning. The remainder of the discussion about Table 10 concerns the overall analysis of the relationship between the present use of objectives and their future role in program planning and execution.

As summarized, three major kinds of factors emerged in the assessment of the performance of the children on the objectives established in preprogram planning:

1. Developmental factors -- related to the readiness of the child to perform at the level prescribed in the objectives, for example, the

Table 10
Summary of objectives for which performance was below criterion in the First or Second Quarter

Objectives	Discussion	Possible Course of Action
FIRST QUARTER Yupik 1. ... able to speak clearly and express original ideas in complete and understandable concepts...	Subsequent improvements shown on a closely related objective evaluated in the second quarter.	No action required except that definition of what constitutes desirable performance and conditions for their elicitation should be made more specific.
2. ...write in manuscript ...all capitals and numerals to five.	Teachers judged that this objective was too far advanced for children to perform during the first quarter.	1. Objectives should probably be deferred to a later instructional period, but no data are presently available as to when, during the year, accomplishment should be expected. 2. More objectives related to writing skills should be included so that closer monitoring over the school year can be accomplished.
English 1. ...able to speak clearly and express original ideas in complete and understandable concepts.	Were the children able to criterion on this objective at this time in the year, there would probably be little need for a bilingual program.	Objectives of this kind should be dropped for the first grade and reconsidered for use as a third grade performance objective.
2. ...able to relate stories in the same language in which they were told or read to them.	Were the children able to perform to criterion on this objective at this time in the year, there would probably be little need for a bilingual program.	Objectives of this kind should be dropped for the first grade and reconsidered for use as a third grade performance ob-ective jective.

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Table 10, cont'd

Objectives	Discussion	Possible Course of Action
3. ...read without prompting the names of half the class and ten words from reading lessons when words are presented on flash cards and the names of the alphabet and numerals to five.	Reading in English is not part of the program design for grade one. Literacy training is to proceed in Yupik only.	Objective should be dropped for the first grade and reconsidered for use as a third grade performance objective.
4. ...write in manuscript ...all capitals and numerals to five.	Reading in English is not part of the program design for grade one. Literacy training is to proceed in Yupik only.	Objective should be dropped for the first grade and reconsidered for use as a third grade performance objective.
SECOND QUARTER Yupik and English 1. Names the months of the school year... and days of the school week.	Low performance was not due to general inability at naming. Possible cultural factors were suggested in the Third Quarterly report.	Investigate possibility of integrating discussion of this material into general cross-cultural format, noting the comparative aspects rather than imposing a possibly irrelevant body of knowledge.
English 1. ...uses complete concepts and complete sentences in extemporaneous conversation.	The ESL approach concentrates on this building of oral proficiency by the controlled introduction and practice of specific syntactic structures. The emphasis is therfore not on extemporaneous use of complete sentences in English as much as on the appropriate use of the structures introduced up to that time.	Use the ESL lessons to generate objectives consistent with intended classroom practices.

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ability to write, in manuscript, capitals, and numerals by the end of the first nine weeks of school. More seriously out of place were objectives in English requiring the child to use the second language with spontaneity and complete sentences during the first year of program operations.

2. Cultural factors -- in regard to how the child relates to and behaves in the school environment or how the curriculum is related to the local culture. Often, for example, the objectives imply a Western view of classroom expressiveness and sponaneity not necessarily typical of children in other cultures.
3. Instructional factors -- arising from a discrepancy between what was written as an objective and what was or was not included in the instructional process. Examples are numerous, most seriously in the second language part of the program where literacy skills in English were written into objectives with never the intentions, for sound reasons, of teaching English literacy until at least grade three.

In the evaluator's view, these problems stem from the fact that the objectives were externally determined. This problem has its roots in the very beginning of the bilingual program. According to federal guidelines it was necessary for those responsible for developing the original funding proposal to generate lists of performance objectives for use in the program. These lists were thus generated prior to the inception of the program, under a very tight time schedule, and as often occurs in federally funded programs, independent of those subsequently hired to carry them out. It was a natural outcome for

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these same objectives to serve mainly, as presently they do, to give pro forma feedback to program management to meet considerations of program evaluation guidelines.

But as long as the objectives remain external to instructional practice, sometimes coinciding with teacher intentions, and sometimes not, the real purposes of instructional evaluation will not be served, to provide immediate feedback to the teachers as to the performance of the pupil on a specific lesson taught. Thus, a particular teacher comes to know the precise capabilities of a particular child, a process from which will eventually evolve normative expectations of what constitutes an appropriate curriculum for Alaska's native children. As now practiced the process is reversed, stating the expectations independent of and prior to the development of the curriculum, preordaining such and such to happen without first establishing its place either in the readiness of the child or in the cultural framework of the community the program is designed to serve.

It was recommended (a) that the further use of externally dictated performance objectives cease; (b) that instructional program planners take steps to train all instructional personnel and curriculum developers in the proper implementation, the function, and the limitations of performance objectives in an instructional program; and (c) that each teacher be responsible for the development of objectives consistent with the immediate instructional process and for the purpose of gaining information about the performance of a particular child in a particular instructional episode.

If instructional objectives are to be useful at all they must be developed within the growth of the program and within the growth in expertise of the teachers called on to carry them out. As part of his attempt to bring such changes about, the evaluator offered a broad conceptualization of conditions necessary to give instructional objectives an appropriate role in bilingual educational programs both for evaluation and for program improvement. At the risk of being overly basic an attempt will be made here to clarify some of the issues regarding the implementation of local instructional objectives. First, the main reason for evaluating the bilingual program's instructional processes is to improve instruction. And while improving instruction can take on many different meanings, Alaska's bilingual programs are unequivocally committed to a definite number of implicit reasons, namely, that the instructional process should meet the individual needs of individual pupils, the instructional process should reflect the desires of its local recipients, including the local community, the parents of program children, and the children themselves, and the instructional process should also include the best input from a wide variety of resources, such as central administrative staff, program developers and consultants, and materials developers.

Second, the improvement of instruction rests ultimately in the hands of the teacher by virture of his/her near exclusive contact with the children in the classroom. It therefore follows that the proper place for evaluation is in the hands of the teacher if we expect evaluation to have anything to do with the improvement of instruction. In this case, evaluation is simply another word

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for information. But this information is of a rather special kind and should lead directly to further refinement of instructional objectives.

The way it is used here the concept of instructional objectives refers to any broadly defined method whereby a teacher finds out from her pupil's performance if anything is being taught (or learned). That is, the teacher has certain instructional intentions in mind when entering into the life of the child. These intentions generally fall into two categories; intentions regarding what things to teach, and intentions regarding how to teach them. How a teacher first arrives at these intentions, while important, isn't an issue so much as what the teacher does to modify them after getting into the classroom because it is there that the teacher translates her intentions into actions. So the teacher translates her intentions in response to a variety of inputs depending on which category of intentions one refers. That is, if one refers to the category of what things to teach, the teacher should seek input from the community, parents, program staff, and other administrative sources to establish her intentions. But if one refers to the category of how to teach, the teacher's best (perhaps only) source of input is from the pupil's performance following the teacher's attempt to carry out her intentions, i.e. can they show the learning the teacher intended to have taken place.

This brings us to the implementation of the presently discussed program, which has a set of stated objectives. This set of objectives in their present form failed to meet a most important condition that the teacher must have made an overt attempt to carry out the stated instruction. The set of objectives was generated prior to and independent of the input of current program practitioners.

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And as long as the objectives remained external to instructional practice, sometimes coinciding with teacher intentions, and sometimes not, the real purposes of instructional evaluation could not be served. Immediate feedback could not be provided to the teachers as to the performance of a particular pupil on a specific lesson taught.

What must be avoided is evaluation-for-evaluation's-sake, and this includes evaluation for the sake of fulfilling federal program guidelines. All evaluation activities must serve at least one of two purposes: (1) to provide specific feedback to guide program modification so that adjustments can be made to assure the program is running its intended course, and (2) to provide general feedback to program management, program funders, and the general public that the program does or does not show effectiveness. The first purpose is to assure the program is being carried out and the second is to show the outcome once it is carried out. It seems wasteful to evaluate according to the second purpose without thoughtful consideration of the first since even a successful outcome would leave one at a loss to replicate the program system-wide, not knowing what it was that was so effective. On the other hand, if the general outcome indicates noneffectiveness it could be either because the program is not really effective, or because the program as intended was not really carried out, and without both kinds of evaluation data we would be at a loss to tell which. Because the project lacked a comprehensive body of instructional objectives the project failed to meet the real purposes of evaluation, particularly evaluation to determine if the program is running its intended course.

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This analysis of instructional objective would not be complete without raising perhaps the most basic question of all, whether or not their use even fits the cultural framework of the first language teacher and the community in which instruction is taking place. Judging from the apparent confusion about objectives within the program and the failure (discussed in quarterly evaluation reports) of direct attempts to implement fundamental changes in the program regarding the role of instructional objectives, such a question seems appropriate. If bilingual education is to carry out the goal of reflecting the culture of the community on one hand, and preparing the child to cope in an English speaking market place on the other, all resources inherent in the child's community must be respected. Respecting the language is only one part of the total context. If indigenous methods for contributing to the survival of the culture through its transmission of the young are infringed upon by western processes, only partial success or even perhaps defeat can be expected. The use of instructional objectives construes the world in a peculiarly western way. Their use implies a perception that all behavioral phenomena can be anticipated, explained verbally and objectively, and those that can't be either don't exist or are trivial. Whether the validity of this position can be defended even within the bounds of western philosophy is not as important an issue so much as the possible existence within the bilingual community of historically different ways of meeting the problem of cultural continuity which maybe diametrically opposed to the basic philosophy underlying the use of instructional objectives. To insist on objectives even as an external management tool carries the value that one

system of getting the job of education done is better than another. The best process must not only be defined within the cultural context of the community in which it functions, but must also be given time in which to emerge through its own local evolution with a minimum of preconceived avenues and boundaries.

The Instructional Process

In addition to aspects of the instructional process implied in the discussion of instructional objectives above, there are other specific issues arising during the course of program evaluation worth noting.

The first important issue concerns the relative timing of literacy training in the first and second languages. The implicit intent in framing the Yupik bilingual programs was clearly to develop literacy first in the community language (Yupik), and simultaneously develop the child's oral capabilities in the second language (English), later transferring the initially learned literacy skills to English after oral proficiency had been developed to an appropriate degree. Two events occurred in the second and third years of the ASOSS bilingual program which illustrate problems of implementing this important program component established with what appeared to be clear rationale.

The first event took place during the evaluator's field visit to one of the participating villages in which he was made aware of the existence of a Title I phonolinguistics program. The school personnel there were apparently dismayed at the amount and extent of diagnostic testing that was going on in connection with the program. First, there seemed to be some incompatibility between goals of the phonolinguistic program and the bilingual program with

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regard to literacy training since the bilingual program was committed to training children in literacy in their first language, Yupik. Such training was to continue throughout the primary grades up to and including grade three. The development of English literacy was deferred, by plan, until such time as literacy in Yupik was achieved. On the other hand, English was to be introduced through the methods of teaching English as a second language giving a strong commitment to the development of oral English speaking ability prior to any attempt at developing English literacy.

The phonolinguistic program apparently was proceeding on the assumption that the first literacy training, or for that matter the only literacy training, was to be in the English language through the use of a compendium of many and varied "prescriptive" approaches to the development of reading and writing in English. That is, literacy training in English, according to the phonolinguistics program was to proceed without regard to what the child has learned in Yupik during the first six years of his life and his primary grades. In the bilingual program, literacy skills in English are referenced to what the child has learned in Yupik literacy, and in oral English. Areas of transfer and common literacy operations and skills were to be analyzed and capitalized upon as further knowledge was gained of the child's literacy skills in his first language. Since reading skills in Yupik were not assessed in the phonolinguistic program and no plan then existed for assessing them, it was difficult to know in what way the phonolinguistic program was to capitalize upon the development of reading skills in Yupik other than by sheer coincidence and accident.

The second event took place the following year and came to light during an evaluation site visit. In two sites, some of the second language teachers mentioned the apparent readiness for some grade two children to proceed with the development of English literacy. It was noted by the teachers that some of the children were spontaneously decoding labels from packages, instructions on materials, etc. all in English. There was understandable desire on the part of the teachers to capitalize on "the teachable moment", and capture the momentum of the child's apparent motivation to learn to read English. These events presented program management with some issues therefore not dealt with in depth. A sizeable split in opinions occurred between the two or three ESL teachers who brought up the issue, and university staff, namely the director of Eskimo Language Workshop, the curriculum specialist, the evaluator, and the ESL program specialist. Lengthy discussion ensued during a subsequent inservice training workshop and as a result, the Anchorage based program director decided to allow the ESL teacher to proceed with English literacy training with a few of the children who seemed ready. It was the view of the program director that failure to do so would somehow hold the children back. This decision was made in the face of rationale offered by the opposition that simultaneous literacy training in two languages would subvert the purpose of the program, detract from the oral English language development of the children, and interfere with progress in literacy training in Yupik.

In an attempt to clarify the situation, the evaluator suggested that the two basic issues are: a) When is the child "ready" to learn second language

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literacy, and b) what is (are) the best method(s) for facilitating the acquisition process? With regard to the first issue, two possibilities seemed preeminent. The decision could be based on the child's readiness to learn or it could be based on the teacher's readiness to proceed. In the former case, the school calendar assumes less importance than in the latter. That is, the teacher can "declare" all children (or some subset) "ready" on a prearranged day, for scheduling purposes (e.g. "by the middle of the second grade") whether the child is truly at that point or not. Or, the children could be treated "individually", and begin their second language literacy training as they become ready. But the latter choice, while satisfying legitimate needs for individualizing the curriculum, is not without its own set of problems, chief of which is the implied mandate to establish performance criteria by which a given child can comfortably be declared "ready", with the subordinate problem of how to individualize the experience.

To date, no precise performance guidelines exist in the bilingual program to determine when the child is ready to proceed with second language literacy. To begin the conceptualization of the problem, two areas of information should be considered as necessary conditions for readiness:

1. The child should have begun to show spontaneity in oral English, i.e. have internalized some of the basic patterns presented in ESL and can use them automatically and appropriately in generalized form with new combinations of familiar content with English speaking persons other than his ESL teacher.

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2. The child should have mastered all basic skills in first language literacy from which necessary transfer (e.g. in prereading skills) could be obtained without the risk of the second language literacy training (English) interfering with continued growth in mastery of first language literacy.

Both of these criteria address some basic assumptions of bilingual education, a) that a second language system not be imposed on an incompletely learned first language system, and b) that only when the second language (or first for that matter) becomes a natural oral behavior for the child, will literacy in it do him any good.

The question of individualization of instruction is not just a matter of second language literacy training and so cannot be considered apart from the entire school curriculum. The dilemma presented, i.e. the above stated desirability of individual instruction in second language literacy and the presently nonindividualized curriculum, is one that needs long range attention at every level of policy development and implementation; the present circumstances only serve to underline its need.

Curriculum Content

Probably the most interesting issue directly related to curriculum content is in the structure of bilingual mathematics. The issue serves to highlight problems sometimes encountered in developing a bilingual education program in which the best of cultural elements are represented. The controversy rests on three general factors. First, Yupik counting systems differ from English

counting systems not only linguistically (i.e. different names for numbers) but also mathematically in that they are not on the base ten. So a western approach to math curriculum in the Yupik language must somehow cope with the mathematical as well as the linguistic differences, and simple translation will not necessarily work. Second, Yupik names for numbers beyond thirty or forty are relatively long and complex making even simple counting a sometimes laborious process, potentially occupying a great deal of student and teacher energy. Third, while it is possible that the average adult Eskimo and the average adult Caucasian have about the same day-to-day needs regarding math, and the probability of having to solve some calculation or counting problem may not be too different, the relative stress placed on simple and higher math in the western upper grade school environment far exceeds what the indigenous culture would normally prepare the child to handle.

The approach taken in the program has been to use a standard math textbook as a basis for teaching math, supplemented by teacher made work sheets. Local translations are used in each village but with English names for numbers in most cases, with the exception of learning the Yupik names for numbers in the early phases.

To some extent the allowance of local options is an admission that the problem has not been solved entirely. And, aspects of the problem are not only mathematical or linguistic but cultural as well, so any attempt to make a change to adapt is also a change toward language standardization in which the

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indigenous systems and the western systems are combined into an unknown though not necessarily inappropriate synthesis.

One interesting outcome of this synthesis was seen in the previous chapter under the comparative math achievement results. Despite the relatively poor counting performance shown by bilingually taught children, their ability to do arithmetic computations seemed unimpaired. The long range implications of these results are not known but seem serious enough to warrant further exploration by a wide variety of experts in concert with Yupik teachers who now may have enough insight into the problem to offer valuable ihput.

Curriculum standardization is not by any means necessarily bad, neither is it necessarily good, as attested to by most of the early part of this chapter, and in conceptualizing the issue it seems curriculum standardization could come about in two main ways; it could be imposed by agents external to the setting, language, and culture, or it could be the outcome of a process of "natural selection" where normative expectations evolve over a period of time guided by trial and error practice by persons internal to program operations. The obvious disadvantages of the former are the continuation of the dominant culture model as well as the premature structuring of the curriculum to the possible exclusion of important local input. The disadvantages of the latter reside in the potential for haphazard unplanned development and the possibility of excluding contribution for the wider world of pedagogical experience.

A reservation held by the evaluator is in the tendency for the Yupik curriculum to be designed by non-Yupiks, which would seem to compound the

already extensive problem noted earlier regarding the external imposition of instructional objectives onto the program. From where will come community input? From where will come input for experienced first language instructors? Is the Eskimo Language Workshop to be the only native voice in Yupik curriculum development? Or will a systematic plan emerge from both agencies that will guarantee a major share of curriculum development to be placed in the hands of native people.

Besides issues specifically related to the math curriculum there is another, more general issue of how to balance the curriculum content between Eskimo and non-Eskimo culture systems. Mention was made before of a discontinuity between cultural processes in relation to the use of instructional objectives to guide instructional processes. Here the issue is to evaluate the direction of the content of the curriculum toward eventually widening the scope of knowledge the child eventually has of cultural, social, and economic practices outside his own early experience. At one extreme lies the position that Eskimo children should be born and bred to maintain, perhaps even recapture, the traditional Eskimo culture, while at the other is the view that the goal of school is to anglicize or westernize the children as soon as possible, to get them in the "mainstream" of American life. Between these two extremes is the course of Alaska's bilingual programs, a course reflected more or less in the content of the curriculum. While much if not most of the curriculum content is Eskimo in form, it is basically western in process. But no really clear statement has emerged in this difficult issue to state the function of Eskimo content in the curriculum,

other than its presumed power to enhance the self-concept of the Eskimo child or to maintain a high level of school motivation. Reasons relating to the probability of the culture surviving have not been given in any policy statement known to the evaluator. In fact, interviews with program officials suggest that many of them feel the main goal of the program is to help the children learn English faster in order to be able later to handle an all English curriculum. Evidence shows, reported in previous evaluation reports, that the program parents want their children to learn both languages, but no evidence exists to date suggesting the parents don't want their children to be Eskimo upon graduation.

Staff Development

Issues in bilingual program staff development can be classed as questions of a) development team interrelationships, b) career development for first and second language teachers.

Two domains of interpersonal relationships within bilingual teams should be identified. The first domain has to do with the quality of interpersonal feeling among first and second language instructors. By this I refer to the degree to which staff feels mutually comfortable with one another in an atmosphere where they can express themselves with candor and understanding. The second interpersonal domain has to do with the potential for interchange of competence between first and second language instructors.[1]

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[1] Detailed reference was made to this domain in the Second Quarterly Report under the Staff Development component and the reader may wish to refer to that material and the recommendations made there.

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Indications came to light during the second year concerning potential problems which arose out of the necessary interaction between these two kinds of interpersonal domains. Before getting into these problems, however, it may be well to review the evolution of interpersonal relationships in both of these domains since the beginning of second year program operations.

Beginning with a program development workshop held in Anchorage in August, 1971, one main objective was to establish the viewpoint of both first and second language instructors that an equalitarian relationship was desired; a relationship where mutual trust and respect was held by all members of the team for every other member. Also in that workshop an attempt was made to develop a perception of role definitions that was consistent with the relative competence each member of the team had in his own area of expertise, whether second language instructor with a background of certification and academic training, or first language instructor with a background implicit cultural awareness and knowledge of the child's first language.

At the end of the preservice workshop it was felt by the program management staff as well as by members of the teaching teams, that these goals had been clarified and were at least within reach at that point in time. However, as noted in the Staff Development component of the Second Quarterly Evaluation Report, there seemed to have grown an atmosphere, in at least some villages, where mutual planning and mutual interchange of unique resources had come more or less to a standstill. The existence of this atmosphere was shown quite clearly in the midyear workshop held in Anchorage where it was brought to

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light that second language teachers expressed hesitance to intervene in the day-to-day planning and teaching of the first language instructors even though many of the former felt a great deal of improvement was needed on the part of the latter. The principal reasons given for this hesitancy to intervene was the possibility for deterioration of interpersonal relationships in the sense noted in the first domain described above. Some of the blame was even placed on the desires expressed at the earlier workshop that second language teachers perceive first language teachers as autonomous beings and of equal status. This desire seemed to have become translated into a "leave them alone, and don't impose your views" kind of attitude.

By the end of the midyear workshop all personnel, staff, and village teams alike felt much of the problem was reduced by having the air cleared and having feelings expressed through a third party intervening as mediator between first and second language instructors. The subsequent feeling of the staff was that the outcome was successful in neutralizing tension.

However, in later village visits the evaluator was made aware of information indicating the problem was not entirely alleviated. People were talking to one another, and feeling more positive about one another, but there are some indications that no advance had been made in the second language teachers' feeling of comfort in intervening and/or suggesting changes and additions in the teaching skills of the first language teachers. In other words, while rapport had increased between the first and second language instructors on a personal basis as evidence by free exchange of gossip, small talk, and laughter, there

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still remained a great deal of reluctance on the part of the second language instructor to intercede in the classroom on purely pedagogical matters. One comment, typical of at least three villages, was "I know she is doing it wrong but I just don't feel I can step in and correct her". Apparently there was still some fear of deterioration of personal relationships if a strong supervisory-supervisee relationship were to emerge.

This kind of situation may be serious, in that an inherent interpersonal dynamic may exist where an equalitarian relationship cannot coexist with a cross-cultural supervisor-supervisee relationship especially where the supervisor is white and the supervisee is Eskimo. What may be needed is the presence of a third party who can referee from a distance and absorb the feelings of pupil toward teacher without having to maintain a day-to-day bond of friendship.

Career development is an issue of great importance because the level of personnel training can mark the differences between a short term movement that disappears with the funding supply, and a permanent presence in Alaskan rural education. Because the pressure on the native manpower pool is such that needs for staffing of bilingual classrooms and for additional certified native teachers cannot both currently be satisfied, a period of dissatisfaction is inevitable. How temporary the period is rests to a certain extent on current planning for formal career development of a substantial cadre of certified native and ESL teachers capable of sustaining a bilingual curriculum. It seems quite clear now that as long as bilingual program career development is contingent upon the existence of program funding, the personnel will disappear as soon

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as funding dries up. The circle is vicious. The program depends on personnel who depend on the program. Personnel must be trained who can occupy permanent positions and teach bilingually.

The role of academic training in developing the potential of bilingual teams continues to be of great importance. Since the inception of the program, the necessity has been recognized of having a group of certified native teachers versed in local languages and capable of handling classroom teaching demands. However, progress has been slow and inconsistent toward the creation of an efficient and effective means of realizing this goal. A number of factors help explain why. First, an anticipated linkage with the Alaska Rural Teacher Training Corps (ARTTC) did not materialize, largely because of a concern that introducing new persons into already constituted village-based learning teams would shift the nature of the program and confuse the process which was then just getting underway. Also, the full-time duties of the first language teacher would take away from the time required for ARTTC training. Second, without a field based training curriculum a dilemma occurs wherein the trainee cannot advance his academic status at a signficant rate without also being lost to the bilingual program for some length of time. Third, first language instructors have generally spent most of their energy integrating themselves into their new status with all the attendant adaptation demands.

In any event, a degree granting program did not materialize in which the first language instructor could make significant progress toward a degree and certification without interrupting service to the bilingual classroom. To

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develop such a program was beyond the funding scope of the program design, if not also beyond its resources. However, if the ARTTC program itself cannot be the vehicle for certification of bilingual personnel, the ARTTC model could certainly become the conceptualizing scheme for whatever method is finally chosen since the aims and outcomes for the ARTTC program so far are not incompatible with the personnel needs of the bilingual movement in Alaska.

So far, the academic needs only of the first language teacher have been treated, without reference to the unique skill demands made on the second language teacher. Among the skills required of him, one of the most important for the second language teacher to develop is expertise in teaching English as a second language (ESL). Often this area of skill development is completely new to teachers in rural Alaska and hence must be gained while on the job.

To conclude, it can be safely stated that the program of staff development has certainly achieved an important, but limited, goal; to create autonomously functioning teams to carry out a program of bilingual education in each of the target villages. Some anticipated and some unanticipated sources of attrition left some of the teams with less staff than optimal, but in no case was any team seriously short handed.

In the long run, however, a useful certification program will be needed to provide for future staff needs in Alaskan bilingual education. A serious effort must begin in which a field-centered training program is developed with such a purpose in mind. Such a program must guarantee the presence of enough interim staff to meet the present needs for bilingual programming as

well as offer a relevant curriculum of study leading to reasonably rapid acquisition of competence for certification in classroom teaching.

Materials Development

Materials development in the Yupik bilingual program has been the nominal responsibility of the Eskimo Language Workshop of the University of Alaska. The Eskimo Language Workshop had its roots in a lengthy period of preprogram development, the major task of which was to create a Yupik orthography capable of sustaining materials for the program at a high level of quality. Because of its roots in the linguistics of the native culture and because of the newness of the program concept in Alaskan education, the Eskimo Language Workshop initially saw its primary roles to be development of Yupik materials, and training of first language teachers in the literacy skills necessary to use them. Pedagogical aspects of the program as well as the English language components were assumed to be under the broader control of program management residing in the agencies responsible for conducting the programs in the villages.

These considerations are given to establish prespective in analyzing what the evaluator believes to be the fundamental issue arising in materials development; the issue of the degree to which materials development and curriculum development are integrated throughout the program. The program began under the enormous task of creating a comprehensive set of materials to sustain the entire range of academic curriculum in a brand new orthography in a brand

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new program. It soon came to light that there was no comprehensive plan guiding the development of curriculum.

The development of a reading curriculum provides an example showing the complexities of the program. One of the major problems, of course, was to generate a set of readers consistent with a guiding philosophy of how reading is best taught. Two important aspects of the problem can be shown, each with its own share of controversy. First what is the "best" method for teaching reading, or is there a "best" method? Second, are the criteria for evaluating a method for teaching the reading of English appropriate for a method of teaching Eskimos to read Yupik?

In the early stages of the program, the issue centered on the assumption that what is good for white children learning English is not necessarily the best way to organize the world of prereading material for Eskimo children. What is best in the latter case was simply not yet known to anybody qualified to translate such knowledge into materials development. A plan evolved to mold the reading program around culturally relevant themes with content of as high interest as possible. This strategy was intended to minimize reliance on a formal model, which may not exist even now, for developing specific word attack skills for Yupik literacy.

In retrospect there seems to have been some lessons learned in developing Yupik Language Arts materials. A major breakthrough was realized during the second year in teaming together two native material developers in the Eskimo Language Workshop with a non-native reading specialist, specifically

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to develop a set of readers and prereaders. Besides the obvious fact of the production of some concrete materials, their collaboration underlined the value of wedding materials development and curriculum needs. Their collaboration has also provided a model for the interaction between persons versed in the language and culture and persons versed in pedagogy.

Another example of the complexities of the problem in integrating materials and curriculum development is in the area of social studies. This example also relates to issues of cultural balance in the content of the curriculum discussed earlier.

One of the major developments in materials development in the second year of operation was an apparent widening of viewpoint to allow broad as well as specific curriculum needs a larger consideration in planning the future production of materials. Senesh's "Our Working World", (1964) was initially utilized as an operational and conceptual guideline for a social studies component. Such commerical sources were intended to provide guidelines to create a structure for the relevant curriculum component with the content adapted to fit the cultural demands of the local scene as well as the language around which the whole program is built. Senesh's materials are based on the economics of everyday life; at least <u>everyday</u> for most school children in urban and suburban areas elsewhere in the United States. It was earlier assumed that the concepts presented by Senesh, though not directly translatable, would be adaptable upon analysis to the rural Alaskan cross-cultural situation. After some initial attempts, however, it became apparent that the needs of native children in their cultural

setting could not be met adequately by the adaptation approach. It could not substitute for what must be built from the ground up, with a minimum of pre-conceptions borrowed from the dominant culture.

Unlike the urban white child, the native child must be prepared to cope directly with his past as well as his future. He is the product of more social discontinuities wrought in a shorter period of time than in the urban white child, even though all exist in the era of rapid technological and social change. The forces of technological, economic, and social change, in quantum leaps introduce the native child to adaptation demands that the urban white child assimilated into his cultural framework generations ago and very gradually.

To the white child in a suburb for example, the snow machine is little more than a new recreation, bought and maintained under the same social and economic systems that sustain every other sector of his life. Nothing really new has been added. In direct contrast, the introduction of the snow machine into village life is rapidly assuming revolutionary proportions. Formerly where time was spent securing food from the local environment to sustain a dog team, time must now be spent securing cash income to purchase fuel for the new "iron dog". The economic implications are obvious. Patterns of seasonal mobility are also modified, both by the speed of the machine and by the location of jobs to secure the wherewithal to feed it. Even the health status of children and adults alike has been seriously influenced by this machine as witnessed by the growing incidence of hearing loss among the native peoples through prolonged exposure to the extreme noise produced.

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So, to be useful, a Social Studies curriculum and the materials that give it substance must rise to meet a host of unique and complex demands, both now and in the future. Such demands will likely require a well defined task force of diverse persons each contributing a special source of needed knowledge and experience for their fulfillment. The general consistency of the task force should comprise (a) members of the native community, particularly those involved with education, either as teachers or as school board members, (b) persons knowledgable of the cultural anthropology of Southwestern Alaska, (c) teachers who, though not native, are sensitive to the needs of native children, (d) educators who have known expertise in Social Studies curriculum development, and (e) persons responsible for bilingual program materials development.

The final issue to be discussed in materials development is the degree to which it has been responsive to input from local resources in the villages. In addition to the above stated need for materials to be developed consistent with the ongoing design of curriculum, there has been a long recognized need to incorporate the ideas of teachers who are in close day-by-day contact with the children and their community.

One of the early approaches to the problem was for the Eskimo Language Workshop to encourage first language teachers to submit locally made materials they considered effective and reproduce them formally for distribution to all program sites. Several successful "packages" were developed in the area of teaching prereading and math skills. The main outcome of this issue, however,

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was the recent decision to relocate the entire operation of the Eskimo Language Workshop to the Kuskokwim Community College in Bethel where even greater responsiveness to the field sites could be realized. This move also will enhance the capabilities of program personnel to meet staff development needs and promises a greater long range impact for future program operations in that area.

Community Involvement

The role of community involvement in bilingual education has consistently been the most difficult area for the evaluator to assess formally. To be sure, the anecdotal record shows increasing widespread acceptance of the approach throughout Southwestern Alaska. Parents in the program from its beginning have reported their pleasure with the content and level of performance of the children. The relatively high frequency with which citizens have formally participated in classroom activities to present examples of the traditional culture speaks to the range of potential in the bilingual approach for bringing the school and community closer together. On a wider scale, the program's broad endorsement by native leadership throughout the state, as shown in testimony offered for an analysis of education in rural Alaska (Darnell, Hecht, and Orvik, 1974), indicates a favorable climate for its general acceptance at all levels of community influence.

While program acceptance by the community is probably the most important condition for its success, the real issue goes beyond mere favorability

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of attitudes to take in the broader context of community control over the educational policies which allow it to function. All of the issues addressed in this chapter bear on the broader issue of policy control and who retains it, making community involvement in this sense an overriding concern.

At present the form and substance of bilingual education in Alaska is controlled from outside the village context since it evolved and is administered through agency institutions. Even to the responsible agencies, bilingual education continues to have "program" status meaning its funds and personnel are extra to the "normal" school program. In both of these ways, then, the program is "outside" of the village context and any further questions as to community involvement must be referenced to those facts. Therefore, until the larger question of local control of education is resolved for rural Alaska, the question of community support of bilingual education will continue to be clouded by the unknown extent to which its acceptance is symptomatic of the desire of communities to exercise a greater policy making role in all aspects of education.

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CHAPTER V

Theory and Research for Bilingual Education in Alaska

The purpose of this chapter is to present two general areas of theory relating to bilingual education and an outline of research directions which might be taken. The intent is to widen the scope of ideas about the psychological and sociological significance of this educational approach beyond its present range. The author's impression is that educational practitioners responsible for developing, administering, and evaluating specific programs tend to address their activities to immediate educational outcomes and operations without substantial regard for the theories upon which they are based or which might serve as a broader context for making future decisions.

For example, it might be predicted that few bilingual program personnel could state a basis in theory as to why the contexts in which the two languages are taught might be kept separate. Yet language separation is a common bilingual classroom practice. One area of theory presented here addresses the significance of language separation, not only for the learning environment it creates but for the relevance it may have for establishing patterns of cultural identity.

An other area of theory is about the interaction between formal and informal learning systems and the bilingual education process. This area was touched on the previous chapter in the discussion of instructional objectives in the cultural context of Southwestern Alaska. A broader theoretical statement

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should help put these observations in perspective, allowing greater understanding of the potential sociological impact of bilingual education.

The basis for these theories comes from previous work done by the author during and since his work as bilingual program evaluator. The research needs outlined in the final section of this chapter include, but are not necessarily limited to the theory statements outlined below. An attempt is made to comprehend a variety of directions needing research attention.

Theory Issues

Bilingual Education and Cultural Identity

The first area of theory to be discussed focuses mainly on the individual as a language learner (as opposed to a learner in general). The work draws upon the general framework of psycholinguistics, followed later by a discussion broadened to include the individual as a learner per se existing in a social environment.

Compound-coordinate bilingualism. One of the earliest psycholinguistic contributions to understanding bilingualism is the concept of compound and coordinate bilingualism. The distinction between these two types, first made by Weinreich (1953), has been the subject of considerable discussion and research. Reviews of this concept (Ervin and Osgood, 1954; MacNamara, 1967 and others) bring to our attention some of the characteristics of these two general types:

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(1) compound types -- those for whom the meaning systems underlying their two languages are fused so that essentially identical meanings are attributed to corresponding words and expressions, and

(2) coordinate types -- those for whom two languages are supported by different meaning systems so that different or partially different meanings are given to corresponding words and expressions.

Compound bilingualists are presumed to have acquired their languages within the same learning context. This occurs either directly, as in a bilingual home, or indirectly where one language serves as a medium for learning another. The coordinate bilingualist, on the other hand, has two distinct language systems because (presumably) they were developed in two distinct learning contexts.

The approach to the distinction taken by Ervin and Osgood (1954) was to posit different internal mediating processes to the two kinds of bilingualists. The coordinate type is said to have two sets of mediating responses for corresponding terms whereas the compound bilingual has only one.

Later discussions, notably by MacNamara (1970), relate the issue to specific "instances of semantic interference" between the compound bilingual's two languages. Thus, two characteristics may serve to distinguish compound from coordinate systems: 1) the extent to which the speaker maintains two separate language systems each of which is undergirded by a separate meaning system, and 2) the extent to which cross-language interference exists for the individual bilingual speaker. Separate systems characterize the coordinate bilingual whereas the compound bilingual's two languages have a common, undifferentiated

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meaning system into which both languages are translated for thinking and retranslated for communication. Relatively less cross-language interference and hence more efficient mental processing in either language is generally predicted for the coordinate bilingual for most activities.

The experimental work of Lambert, et al. (1958) portrays the extent of differences the language learning context can make.

> It was found that experience in separated contexts comparatively increases the associative independence of translated equivalents in the bilingual's two languages. If the bilingual has learned his two languages in culturally distinctive contexts, the semantic differences between translated equivalents is comparatively increased. (p. 60).

Regarding experimental problem-solving tasks, Stafford (1968) compared Navajo children classed as compound bilingual, coordinate bilingual, or monolingual in English by their language learning context. The tasks were to discover a correct (rewarded) response to a combination of visually presented stimuli assumed to require verbal mediation. As was predicted, compound bilinguals scored less than either coordinate bilinguals or monolinguals, and there was no significant difference between the latter types. Interviews after the task showed compound bilinguals to have used both languages in problem solving over twice as often as coordinate bilinguals and suggested the latter apparently tend to function with only one language at a time.

Mediational interference in which the user tends to associate two sign equivalents to the same meaning response was suggested as a basis for reduced problem solving efficiency of compound bilinguals. Stafford concluded, "an

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implication of this study is the desirability of minimizing the chance of mediational interference among bilinguals by emphasizing the development of coordinate systems".

Finally, one may conclude from the cited literature, that generally the coordinate bilingual is more likely to be able to function the way a native speaker would in either of his languages. What kind of bilingualism (compound or coordinate) the bilingual classroom tends to foster relative to the traditional village classroom is therefore a cognition question of great importance.

Cultural identity. Of even greater importance to the present theory is whether the distinction between compound and coordinate bilingualism also describes ways in which patterns of bicultural identity formation may develop in a child. A bicultural environment may be said to comprise bicultural elements in physical as well as in social domains. The physical domain consists of symbols and implements, and the culturally prescribed meanings and uses they are understood to imply. Spicer (1971) points out "The essential feature of any [cultural] identity system is an individual's belief in his personal affiliation with certain symbols, or, more accurately, with what certain symbols stand for" (p. 796). A child who understands that different cultures prescribe different meanings and uses for physical things and can incorporate such understanding into his own view of the world is at some advantage in coping; and indeed may be more likely to participate in the survival of his indigenous culture system.

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As with the physical domain, the social domain may include bicultural elements. But instead of dealing with meanings and uses, the social domain consists of social practices, or more simply, social behavior and its antecedents. For the native child the critical aspect of biculturalism in the social domain is that behavior is only intelligible with reference to the cultural system that defines and maintains it. Any explanation of "why A did x" that does not take into account the social practices of A's culture would be no more adequate than explaining to someone unaware of the rules of football that "A scored a touchdown". The child who encounters a bicultural environment necessarily deals with two sets of social practices, each prescribing its own rules of intelligibility much as different languages prescribe unique rules of grammar and syntax for intelligible communication.

In the presently discussed theory cultural identity has two components, the first of which is the level of understanding the individual has about the culture's physical and social elements. In a sense, understanding a culture represents the qualifications or credentials necessary for participation or identification with a culture. One cannot hope to relate to a cultural symbol for example, unless he knows what it currently symbolizes (Spicer, 1971). Likewise, until one knows the appropriate usage of a particular implement he will experience some degree of estrangement from those in a culture who have a "natural" or "inside" knowledge of what is for and how it is used. More serious, however, is the level of understanding one has in the social domain that qualifies a person to participate in a culture. Much in the way one must know the rules (formal

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and informal) of football in order to be allowed to play, so must one understand the social practices of a culture in order to be qualified to participate; at least without drawing too much attention to oneself.

The second component of cultural identity comprises patterns of choice between elements of two existing cultural environments. Again, the physical and social domains each require conceptualization for the choice patterns predicted to be shown by the person who identifies (by virture of choice) with his indigenous rather than the dominant culture. In the physical domain, the child who identifies with his indigenous culture would tend to prefer, positively evaluate, or approach, familiar symbols, implements and vistas associated with that culture relative to corresponding physical entities of the dominant culture. In the social domain, choice patterns are in evidence when certain modes of social interaction are preferred over others, holding level of understanding theoretically constant.

Neither choice nor understanding alone supply the sufficient conditions for establishing cultural identity in an individual, but both are necessary. Absence of either component sentences the individual to peripheral participation in a culture except perhaps during extended periods of rapid culture shift. Such periods may be defined as times when exceptions are made for certain new choice patterns and incomplete understanding regarding some aspects of the traditional cultural system.

Language must be assumed to play a central and continuing role in the acquisition and organization of the personal identity of the individual who

speaks it. And, as in the view of Spicer (1971), a language may be assumed to play a central role in the continunity and maintenance of the cultural identity of its speakers throughout their history as a group.

The Language Situation in Alaska. According to Krauss (1971), as many as twenty distinct indigenous languages have been identified among Alaska's native people. The diversity of cultures underlain by this polyglot contributes a good deal of complexity to the accelerated emergence of the native people as a socio-political force in their own and in Alaska's future.

However, each of Alaska's many diverse language/culture groups has at least one characteristic in common. Each has faced and will continue to face the social and economic pressure of the dominant American cultural system. Despite members of each language group being historically monolingual in a native dialect, English has dominated throughout recent history as the language of communication during exchanges between native and non-native cultures.

The history of this language exchange process has culminated in a wide spectrum of language patterns among Alaska's native people. At one end of the spectrum are those who are essentially monolingual in a native dialect. For example, many native children in Southwestern Alaska enter school with Yupik, the language spoken in the home, as their only language of communication. Most of the children of that area, however, are unevenly bilingual in Yupik and English, but the relative proficiency in the two languages varies markedly from child to child and village to village. Finally, at the other end

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of the spectrum of language use are those natives monolingual in English. There are whole dialects, e.g. Tsimshian and Haida, spoken only by the older people of the village, and one dialect, Eyak, comprising only three speakers, one of whom is a white linguist.[1]

No matter where on the spectrum one is placed, there are probably few Alaska natives who are far enough removed from some native dialect to be able to claim complete freedom from its influence on the development of thought, feeling, and intellect. In fact, virtually all Alaskan natives have either negotiated or will soon negotiate a developmental phase of bilingualism in which the native language is joined by the English language as an additional and sometimes sole means of communication. The whole range of responses to this "developmental phase" exists presently in Alaska, inviting systematic inquiry into the complex nature of its processes.

In the present theory the foregoing issues bear a special relationship to one another when viewed in the light of bilingual eduation. First, bilingual education programs reported here are committed to developing the child's two languages in separated contexts, thus endeavoring implicity, with varying degrees of overt intention, to foster coordinate bilingualism. Second, virtually all bilingual program, including those in Alaska, are committed to the enhancement of the child's self concept, most often by developing major portions of the school curriculum around the child's cultural background. The question is

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[1] Michael Krauss, personal communication, 1974.

raised then, whether children who function simultaneously under both processes will show the integrated influences of each. That is, are compound and coordinate bilingual systems functionally related to parallel processes in systems of cultural identity? Is the coordinate bilingual more likely than the component bilingual to show greater implicit understanding of physical and social stimili appropriate to the meanings and social practices which each of his two cultures define? And will his patterns of cultural understanding be enhanced by virtue of being held in separate cognitive domains just as are his two languages? Such questions generate the following sets of hypotheses.

First, to the extent that bilingual education (a) intentionally separates the language of learning contexts of the first and second languages, (b) paces and sequences the introduction of the second language, and (c) communicates implicit respect for the first language as a medium of instruction, the participating child is likely to develop coordinate bilingual capabilities. Therefore, children in such programs should evidence (a) superior code-switching abilities, (b) even balance between first and second languages, and (c) patterns of acquisition of grammatical and syntactical structures appropriate to the indigenous nature of each language, relative to native children participating in traditional monolingual (English) education programs.

Second, if patterns of cultural identity formation are related to the cognitive nature of the child's bilingual tendencies, the following predictions should hold:

1. The more a child is characterized as a coordinate bilingual the greater will be the extent and depth of his understanding of the meanings and uses of the symbols and implements of his own and the dominant culture (at least as the latter is manifested in the child's environment),
2. the more appropriately he will be able to behave regarding the different social practices of each culture, and
3. the more articulated (differentiated) will be his understanding and behavior toward the various biculturally defined elements of the environment.

Formal and Informal Education Systems

The second issue related to theory is the distinction between formal and informal education systems conceptualized by Scribner and Cole (1973). Of interest are the cognitive consequences of various social and cultural modes of organizing learning experiences particularly with respect to the apparent discontinuity between formal (school-based) and informal (community-based) operations.

In an analysis of research on relationships between culture and various aspects of cognition, Cole and Scribner (1974), attempted to relate certain trends to participation in formal learning experiences. For example they noted the possible effect of schooling on ways in which objects were classified. The main differences were (a) in the use of broad semantic categories for grouping

things as a result of formal schooling, and (b) in the tendency to give a category label as an arbitrary reason for grouping (e.g. "I just like them this way"). In comparing schooled children with non-schooled adults (of the same culture group) the differences were in the verbal explanations they gave: "younger people with schooling reflect the category nature of their groupings in the way they describe them; [adult] villagers do not".

And, further:

> Attendance at a Western-type school accentuates [the] switch-over to taxonomic grouping principles. But schooling seems to affect even more than this: attendance at school apparently encourages an approach to classification tasks that incorporate a search for a rule - for a principle that can generate answers. . . . At the same time, schooling seems to promote an awareness of the fact that alternative rules are possible. . . Finally, the one unambiguous finding. . . is that schooling (and only schooling) contributes to the way in which people describe and explain their own mental operations. (p. 122)

Differences between traditional and Western cultures in the way problems of verbal reasoning are handled have mainly to do with the extent to which the implied "rules of the game" are adhered to. What seemed to be encountered among people in traditional societies was a lack of concern for remaining within the boundaries of the problem presented by the experimenters, often modifying the terms of the problem, or adding information to bring it within the immediate or past experience of the subject.

In much the same vein, Denny (1972) distinguishes between Western and non-Western modes of thought to be commonly regarded as abstract and concrete respectively. Without casting value judgment about the merits of each, he makes a point similar to Cole and Scribner that non-Western societies should

in no way be considered deficient in their thinking tendencies nor should presumed Western preferences for the abstract be considered especially superior. In fact, Denny's research indicates a significant number of Western reared and educated adults clearly demonstrate purely concrete modes for solving formal concept formation problems. Not only are concrete modes favored by these Western European adults, but are often found to be as successful in leading to problem solutions as more abstract methods even though the former go beyond the implicit situational boundaries established by the experimenter.

Consistent with these findings and the findings of others (e.g. Gay and Cole, (1967)), Denny speculates: "The most probable case is that whichever mode [concrete or abstract] is favored in a culture is the one which is formalized." The concrete mode in some cultures may be, indeed is, systematized and elaborated every bit as much as the abstract mode is in Western culture.

In attempting to synthesize these viewpoints for education, another theory ingredient needs to be added; the nature of observational learning within the context of informal education systems. Specifically, observational learning refers to learning processes among non-literate peoples in which particular practices are taught by demonstration as opposed to their being formulated in words or rules. As Cole and Scribner put it; "Observational learning is usually contrasted with learning that is acquired primarily through the medium of language."

In the bilingual education programs described in this report there are specific interactions between formal and informal systems inherent in bilingual programming that need a closer look. Specifically, in the target schools, the effect of bilingual education is to bring the native language into the formal institutional atmosphere of the school where before it was left to develop in the informal mode of the traditional culture. What then are the cognitive consequences of this shift relative to those shown in nearby village schools carrying out formal programming in English only?

Research Directions

While the potential number of research directions within the field of bilingual education is very large indeed, some of the more pressing ones, in the author's opinion, can be outlined which bring together the implications developed in the theories summarized above and some pragmatic benefits discussed earlier. The research directions proposed fall into three main classes: (1) the study of performance variables, (2) the study of environment variables and (3) the study of the sociology of bilingual education as it relates to bilingualism.

Performance variables to be studied should attempt to provide relative estimates of outcomes attributable to the two different types of programming within the framework of the theories and issues cited previously. Three domains of performance outcomes are of particular interest; cognitive, personality and academic achievement. Within the domain of cognitive skills, of greatest interest are the

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levels of attainment the child shows in each language, the interactions shown between his two languages, with each skill measured in multiple ways, and the relative understanding of the denotative extention of parallel terms. Personality variables of interest could relate mainly to those conceptualized earlier, in which relationships between cultural identity patterns and propensities for compound and coordinate bilingual functioning are investigated. Variables in the academic achievement domain could be of two general kinds; criterion-referenced, identified through input from each local teaching staff, and normreferenced, and could coincide with the on-going assessment programs. Wherever possible the methods outlined by Slobin, et al. (1967) will be used as a supplemental resource for guiding the collection of linguistic data.

The environment variables of interest in the proposed research directions should be, (a) bilingual language exposure (school and non-school), (b) formal and informal learning processes (school and non-school), and (c) the implied conceptual interactions among these two factors.

Within this organization of environment variables those of greatest interest might include but should not be limited to the following:

1. differences between bilingual and traditional programming in (a) formal curriculum design for increasing communicative competence in Yupik and English, (b) formal interrelationships between pupils and native and non-native teachers in Yupik and English, and
2. contrasts and similarities between bilingual and traditional program villages in non-school environmental influences such as, (a) presence

of informal systems of learning among child peers and adults, and (b) relative levels and qualities of pupils' exposure to Yupik and English during non-school hours, particularly through media, such as radio and television.

A general approach has been proposed by Cole and Scribner (1974) for advancing cross-cultural research in communication processes. Their suggestions, however, are equally applicable to any domain of cross-cultural inquiry. Two components are seen as vital; the experimental process in which various features of the domain are systematically manipulated and tested, and the observational process, in which systematic accounts are taken of the everyday functions of the domain in specific situations. These two processes should then be drawn together by translating the observations in natural settings into controlled experimentation, bringing the methods of experimental, and social psychology into closer partnership with the methods of anthropology.

The final research direction called for is less easily delineated but no less important than the first two. Basic to this category is the need to refine and adapt the definitions reviewed in chapter one, to guide a systematic inquiry into the extent of bilingual education on one hand and the sociological context of bilingualism on the other. Such inquiry is largely a problem of sociolinguistics which as a discipline is concerned with understanding languages, and, if I may be permitted, cultures in contact.

There is another dimension to be considered, which is a concern for the sociology of education delivery as a third factor interacting with both languages

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(and cultures) of interest. The education delivery factor assumes its greatest importance as the reflection of, and the vessel for, bilingual education. No amount of clarity of theory on bilingualism can overcome ignorance about how change and resistance to change works in schools. If bilingual education is to achieve an appropriate place in the curriculum, attention must be paid to its total context.

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